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# CONSTRUCTION OF POLAR COORDINATES GRID IN UNIFORM COLOR SPACE, UNIFORMLY FILLING AREA OF EXISTING COLORS, PARTICULARLY OF COLOR GAMUT TRANSMITTED AND REPRODUCED BY TELEVISION SYSTEMS

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# ПОБУДОВА СІТКИ ПОЛЯРНИХ КООРДИНАТ У РІВНОКОНТРАСТНОМУ КОЛІРНОМУ ПРОСТОРІ, ЩО РІВНОМІРНО ЗАПОВНЮЄ ОБЛАСТЬ ІСНУЮЧИХ КОЛЬОРІВ, ЗОКРЕМА, ОБЛАСТЬ КОЛЬОРІВ, ПЕРЕДАВАНИХ ТА ВІДТВОРЮВАНИХ ТЕЛЕВІЗІЙНИМИ СИСТЕМАМИ

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# ПОСТРОЕНИЕ СЕТКИ ПОЛЯРНЫХ КООРДИНАТ В РАВНОКОНТРАСТНОМ ЦВЕТОВОМ ПРОСТРАНСТВЕ, РАВНОМЕРНО ЗАПОЛНЯЮЩЕЙ ОБЛАСТЬ СУЩЕСТВУЮЩИХ ЦВЕТОВ, В ЧАСТНОСТИ, ОБЛАСТЬ ЦВЕТОВ, ПЕРЕДАВАЕМЫХ И ВОСПРОИЗВОДИМЫХ ТЕЛЕВИЗИОННЫМИ СИСТЕМАМИ

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**Abstract**. A method of constructing polar coordinates grid in uniform color space, uniformly filling area of existing colors, particularly of color gamut transmitted and reproduced by television systems, is proposed. Coordinates and position of the grid nodes in color spaces CAM02-USC, CIECAM02 and CIE 1931 $Y,x,y$ and presented in tables and figures. The method and the coordinates of the grid nodes can be used to construct the set of colorimetric test objects and to evaluate color rendering fidelity of light-to-light television path in terms of lightness, hue and colorfulness. Material of the article is built as development provisions, published in [1]

**Keywords:** CAM02-USC, CIECAM02, color fidelity, light-to-light television path, polar color coordinates grid, television system, transmitted color gamut, uniform color space

**Анотація.** Запропоновано метод побудови сітки кольорів у рівноконтрастному просторі, що рівномірно заповнює область існуючих кольорів, зокрема, кольорів, передаваних і відтворюваних телевізійними системами. Координати і положення вузлів сітки у колірних просторах CAM02-USC, CIECAM02 і CIE 1931 $Y,x,y$ представлено в таблицях і рисунках. Метод і координати вузлів сітки може бути застосовано для побудови колориметричних вимірювальних об'єктів і для оцінювання якості кольоровідтворення в телевізійному тракті «від світла до світла» в термінах відносної світлоти, колірного тону та забарвленості. Матеріал статті побудовано в розвиток положень, опублікованих в роботі [1].

**Ключові слова:** вірність кольоропередавання, рівноконтрастний колірний простір, сітка в системі полярних координат, область передаваних кольорів, телевізійна система, телевізійній тракт «від світла до світла», CAM02-USC, CIECAM02

**Аннотация.** Предложен метод построения сетки цветов в равноконтрастном пространстве, равномерно заполняющей область существующих цветов, в частности, цветов, передаваемых и воспроизводимых телевизионными системами. Координаты и положение узлов сетки цветов в цветовых пространствах CAM02-USC, CIECAM02 и CIE 1931 $Y,x,y$ представлены в таблицах и рисунках. Метод и координаты узлов сетки могут быть использованы для построения набора колориметрических измерительных объектов и для оценки качества цветопередачи в телевизионном тракте «от света до света» в терминах относительной светлоты, цветового тона и окрашенности. Материал статьи построен в развитие положений, опубликованных в работе [1]

**Ключевые слова**: верность цветовоспроизведения, равноконтрастное цветовое пространство, сетка в системе полярных координат, область передаваемых цветов, телевизионная система, телевизионный тракт «от света до света», CAM02-USC, CIECAM02

At the time of solving problems associated with the assessment colour rendition of video systems for various applications, including TV and related systems, it is useful to have as test objects set of colors, uniformly filling uniform color space with respect to brightness, hue and colorfulness. In this paper a method of constructing polar coordinates grid in uniform color space, uniformly filling area of existing colors, particularly of color gamut transmitted and reproduced by UHDTV system, and presentation of this colors in standard CIECAM02 and CIE 1931 $Y,x,y$ spaces is proposed.

As the color space used the CAM02-USC space of coordinates $J',a'_M,b'_M$ proposed by Luo et al. [2] transformation of color appearance model CIECAM02 [3]. The method is as follows:

– set the parameters of the color: luminance $L_{DW}$ of white, which corresponds to the adapting luminance $L_A$ of the viewer and the conditions of the environment – average, dim of dark, which corresponds to the actual conditions of TV image viewing;

– set the chromaticity coordinates $x_R,x_G,x_B,y_R,y_G,y_B,z_R,z_G,z_B$ of primary colors and of reference white $x_W,y_W,z_W$ of TV system;

– define the boundaries of a cuboid, covering the existing colour space and projection of body of color gamut, transmitted and reproduced by TV systems in the space of $J',a'_M,b'_M$ coordinates;

– build an array of CAM02-USC $J',a'_M,b'_M$ coordinates, evenly filling a cuboid;

– for each of the points with CAM02-USC space $J',a'_M,b'_M$ coordinates carry out the transition to CIECAM02 coordinates $J,a_M,b_M$ and then to the CIE 1931 luminance and chrominance coordinates $Y,x,y$, and then check belonging the point $(x,y)$ to existing colour space and to color gamut transmitted and reproduced by television systems area for luminance value $Y$ with use of method presented in [4] and exclude color points not belonging to color gamut;

– ordering array of color points in the domain of color gamut transmitted and reproduced by TV system for each level of $J'$ coordinate.

In Figures 1…27 and tables 1…9 there are presented color points in coordinates $J',a'_M,b'_M$ of CAM02-USC space, which are the nodes of the equidistant polar grid with 10 CIE units step belonging to lightness and 5 CIE units belonging to colorfulness on the figures and 10 CIE units step belonging to lightness and to colorfulness in the tables and with step of $90^o/5$ belonging to angular hue coordinate of existing colors space and color gamut transmitted and reproduced by UHDTV systems, as well as their projection to CIECAM02 and $Y,x,y$ space $\left(Y\in\overline{0;100}\right)$, built for the luminance of white $L_{DW}=250\,\text{cd/m}^2$, which corresponds to the adapting luminance $L_A=50\,\text{cd/m}^2$ with average surround.

Black dots on the figures indicate the colors belonging color gamut, transmitted by UHDTV system, and red dots – other colors belonging to the rest of existing color gamut. The tables show the extent to which the luminance of color for given lightness depends on the chromaticity. Solid lines on the figures indicate the boundary of the existing color gamut and of color gamut transmitted in UHDTV system for maximum

brightness and dashed lines – for minimum luminance related to given lightness. Coordinates of existing colors, not belonging to the transmitted color gamut, are marked in the tables in italics.

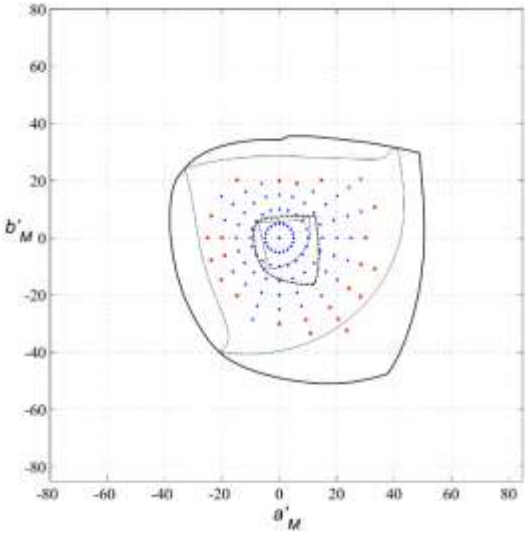


Figure 1 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 10$ on $a'_M, b'_M$ plane of the CAM02–UCS space

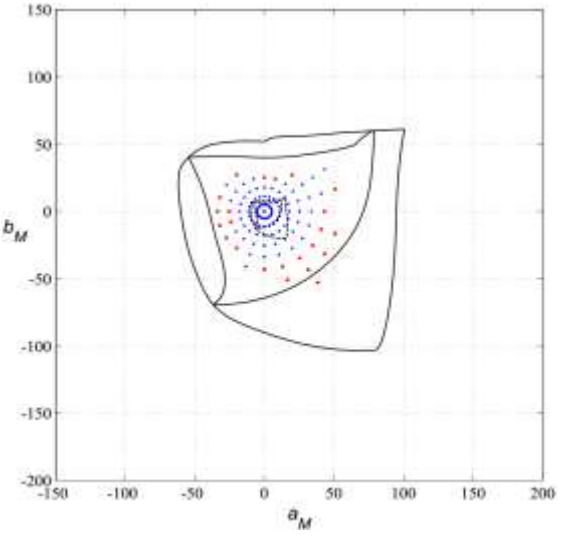


Figure 2 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 10$ on $a_M, b_M$ plane of the CIECAM02 space

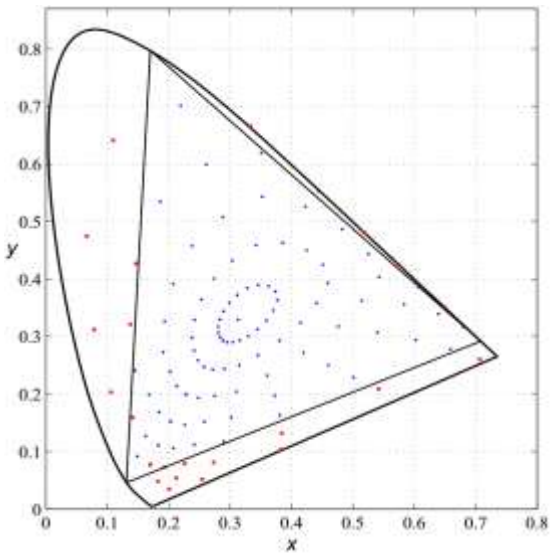


Figure 3 – Color points of existing colour gamut and of color gamut transmitted and reproduced by UHDTV system for $J' = 10$ on the $x, y$ plane of the CIE-31 space

Table 1 – Values of CAM02-UCS, CIECAM02 and $Y, x, y$ color grid nodes coordinates calculated for $J' = 10$ and corresponding $J = 6.13$

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| $M' = 10;\ M = 11.23$ | | | | | | | |
| 0 | 10.00 | 0.00 | 11.23 | 0.00 | 0.6 | 0.380 | 0.293 |
| 18 | 9.51 | 3.09 | 10.68 | 3.47 | 0.6 | 0.415 | 0.324 |
| 36 | 8.09 | 5.88 | 9.09 | 6.60 | 0.6 | 0.440 | 0.358 |
| 54 | 5.88 | 8.09 | 6.60 | 9.09 | 0.6 | 0.459 | 0.393 |
| 72 | 3.09 | 9.51 | 3.47 | 10.68 | 0.6 | 0.451 | 0.425 |
| 90 | 0.00 | 10.00 | 0.00 | 11.23 | 0.6 | 0.425 | 0.450 |
| 108 | –3.09 | 9.51 | –3.47 | 10.68 | 0.6 | 0.385 | 0.463 |
| 126 | –5.88 | 8.09 | –6.60 | 9.09 | 0.7 | 0.342 | 0.459 |

Table 1 (end)

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| 144 | –8.09 | 5.88 | –9.09 | 6.60 | 0.7 | 0.304 | 0.432 |
| 162 | –9.51 | 3.09 | –10.68 | 3.47 | 0.7 | 0.274 | 0.401 |
| 180 | –10.00 | 0.00 | –11.23 | 0.00 | 0.7 | 0.253 | 0.364 |
| 198 | –9.51 | –3.09 | –10.68 | –3.47 | 0.7 | 0.242 | 0.329 |
| 216 | –8.09 | –5.88 | –9.09 | –6.60 | 0.7 | 0.238 | 0.298 |
| 234 | –5.88 | –8.09 | –6.60 | –9.09 | 0.7 | 0.241 | 0.276 |
| 252 | –3.09 | –9.51 | –3.47 | –10.68 | 0.7 | 0.248 | 0.259 |
| 270 | 0.00 | –10.00 | 0.00 | –11.23 | 0.6 | 0.257 | 0.248 |
| 288 | 3.09 | –9.51 | 3.47 | –10.68 | 0.6 | 0.272 | 0.243 |
| 306 | 5.88 | –8.09 | 6.60 | –9.09 | 0.6 | 0.290 | 0.244 |
| 324 | 8.09 | –5.88 | 9.09 | –6.60 | 0.6 | 0.315 | 0.250 |
| 342 | 9.51 | –3.09 | 10.68 | –3.47 | 0.6 | 0.346 | 0.268 |
| $M' = 20; M = 25.34$ | | | | | | | |
| 0 | 20.00 | 0.00 | 25.34 | 0.00 | 0.5 | 0.460 | 0.250 |
| 18 | 19.02 | 6.18 | 24.10 | 7.83 | 0.5 | 0.540 | 0.307 |
| 36 | 16.18 | 11.76 | 20.50 | 14.89 | 0.6 | 0.583 | 0.356 |
| 54 | 11.76 | 16.18 | 14.89 | 20.50 | 0.6 | 0.607 | 0.386 |
| *72* | *6.18* | *19.02* | *7.83* | *24.10* | *0.6* | *0.574* | *0.425* |
| *90* | *0.00* | *20.00* | *0.00* | *25.34* | *0.6* | *0.518* | *0.481* |
| 108 | –6.18 | 19.02 | –7.83 | 24.10 | 0.6 | 0.444 | 0.553 |
| 126 | –11.76 | 16.18 | –14.89 | 20.50 | 0.7 | 0.350 | 0.619 |
| 144 | –16.18 | 11.76 | –20.50 | 14.89 | 0.7 | 0.261 | 0.599 |
| 162 | –19.02 | 6.18 | –24.10 | 7.83 | 0.7 | 0.186 | 0.535 |
| *180* | *–20.00* | *0.00* | *–25.34* | *0.00* | *0.7* | *0.146* | *0.427* |
| *198* | *–19.02* | *–6.18* | *–24.10* | *–7.83* | *0.7* | *0.138* | *0.321* |
| 216 | –16.18 | –11.76 | –20.50 | –14.89 | 0.7 | 0.145 | 0.241 |
| 234 | –11.76 | –16.18 | –14.89 | –20.50 | 0.7 | 0.168 | 0.199 |
| 252 | –6.18 | –19.02 | –7.83 | –24.10 | 0.7 | 0.184 | 0.169 |
| 270 | 0.00 | –20.00 | 0.00 | –25.34 | 0.7 | 0.203 | 0.152 |
| 288 | 6.18 | –19.02 | 7.83 | –24.10 | 0.6 | 0.226 | 0.147 |
| 306 | 11.76 | –16.18 | 14.89 | –20.50 | 0.6 | 0.258 | 0.152 |
| 324 | 16.18 | –11.76 | 20.50 | –14.89 | 0.6 | 0.302 | 0.159 |
| 342 | 19.02 | –6.18 | 24.10 | –7.83 | 0.6 | 0.372 | 0.197 |
| $M' = 30; M = 43.06$ | | | | | | | |
| 270 | 0.00 | –30.00 | 0.00 | –43.06 | 0.7 | 0.170 | 0.077 |
| *252* | *–9.27* | *–28.53* | *–13.31* | *–40.95* | *0.7* | *0.149* | *0.092* |
| *36* | *24.27* | *17.63* | *34.84* | *25.31* | *0.5* | *0.679* | *0.317* |
| *18* | *28.53* | *9.27* | *40.95* | *13.31* | *0.5* | *0.659* | *0.278* |
| 0 | 30.00 | 0.00 | 43.06 | 0.00 | 0.5 | 0.542 | 0.209 |
| 342 | 28.53 | –9.27 | 40.95 | –13.31 | 0.5 | 0.384 | 0.132 |
| 324 | 24.27 | –17.63 | 34.84 | –25.31 | 0.5 | 0.273 | 0.081 |
| 306 | 17.63 | –24.27 | 25.31 | –34.84 | 0.6 | 0.226 | 0.079 |
| 288 | 9.27 | –28.53 | 13.31 | –40.95 | 0.6 | 0.193 | 0.073 |
| 270 | 0.00 | –30.00 | 0.00 | –43.06 | 0.7 | 0.170 | 0.077 |
| $M' = 40; M = 65.32$ | | | | | | | |
| *306* | *23.51* | *–32.36* | *38.39* | *–52.84* | *0.5* | *0.201* | *0.035* |

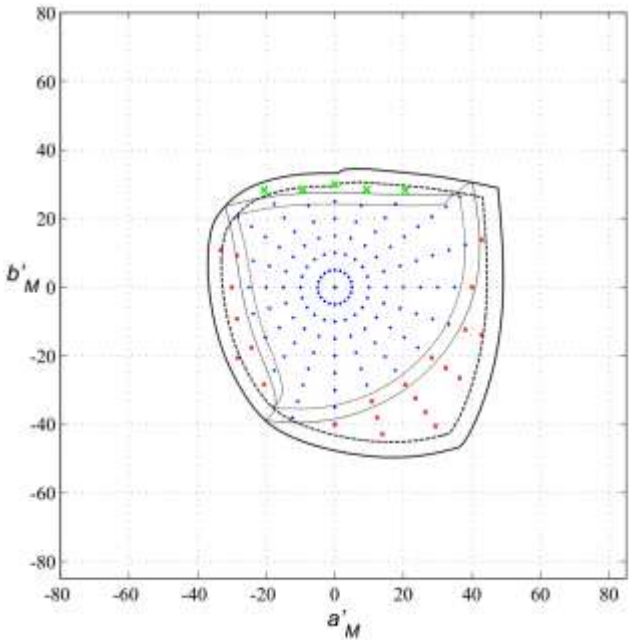


Figure 4 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 20$ on $a'_M, b'_M$ plane of the CAM02–UCS space

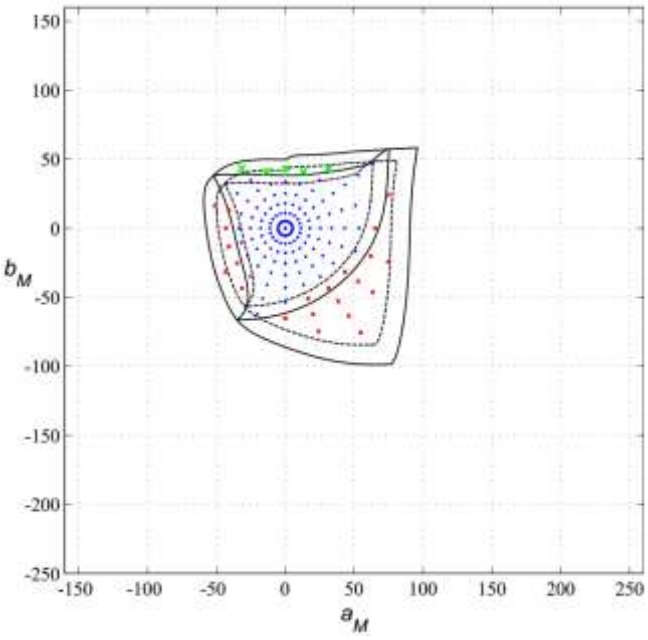


Figure 5 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 20$ on $a_M, b_M$ plane of the CIECAM02 space

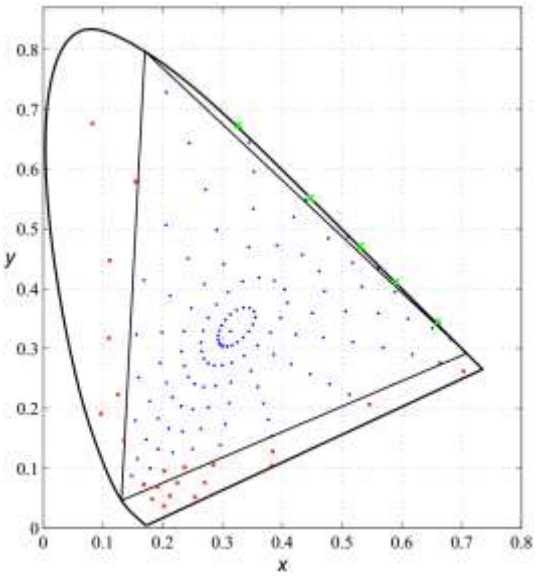


Figure 6 – Color points of existing colour gamut and of color gamut transmitted and reproduced by UHDTV system for $J' = 20$ on the $x, y$ plane of the CIE-31 space

Table 2 – Values of CAM02-UCS, CIECAM02 and $Y, x, y$ color grid nodes coordinates calculated for $J' = 20$ and corresponding $J = 12.84$

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| $M' = 10;\ M = 11.23$ | | | | | | | |
| 0 | 10.00 | 0.00 | 11.23 | 0.00 | 2.3 | 0.359 | 0.305 |
| 18 | 9.51 | 3.09 | 10.68 | 3.47 | 2.3 | 0.380 | 0.327 |
| 36 | 8.09 | 5.88 | 9.09 | 6.60 | 2.3 | 0.397 | 0.351 |
| 54 | 5.88 | 8.09 | 6.60 | 9.09 | 2.3 | 0.408 | 0.377 |
| 72 | 3.09 | 9.51 | 3.47 | 10.68 | 2.3 | 0.403 | 0.399 |
| 90 | 0.00 | 10.00 | 0.00 | 11.23 | 2.4 | 0.386 | 0.414 |
| 108 | –3.09 | 9.51 | –3.47 | 10.68 | 2.4 | 0.361 | 0.419 |
| 126 | –5.88 | 8.09 | –6.60 | 9.09 | 2.4 | 0.334 | 0.412 |
| 144 | –8.09 | 5.88 | –9.09 | 6.60 | 2.5 | 0.309 | 0.394 |
| 162 | –9.51 | 3.09 | –10.68 | 3.47 | 2.5 | 0.290 | 0.374 |
| 180 | –10.00 | 0.00 | –11.23 | 0.00 | 2.5 | 0.276 | 0.352 |
| 198 | –9.51 | –3.09 | –10.68 | –3.47 | 2.5 | 0.268 | 0.330 |
| 216 | –8.09 | –5.88 | –9.09 | –6.60 | 2.5 | 0.264 | 0.310 |
| 234 | –5.88 | –8.09 | –6.60 | –9.09 | 2.4 | 0.265 | 0.295 |
| 252 | –3.09 | –9.51 | –3.47 | –10.68 | 2.4 | 0.269 | 0.283 |
| 270 | 0.00 | –10.00 | 0.00 | –11.23 | 2.4 | 0.276 | 0.275 |
| 288 | 3.09 | –9.51 | 3.47 | –10.68 | 2.4 | 0.286 | 0.272 |
| 306 | 5.88 | –8.09 | 6.60 | –9.09 | 2.4 | 0.299 | 0.272 |
| 324 | 8.09 | –5.88 | 9.09 | –6.60 | 2.3 | 0.316 | 0.276 |
| 342 | 9.51 | –3.09 | 10.68 | –3.47 | 2.3 | 0.336 | 0.288 |
| $M' = 20;\ M = 25.34$ | | | | | | | |
| 0 | 20.00 | 0.00 | 25.34 | 0.00 | 2.2 | 0.415 | 0.274 |
| 18 | 19.02 | 6.18 | 24.10 | 7.83 | 2.2 | 0.469 | 0.318 |
| 36 | 16.18 | 11.76 | 20.50 | 14.89 | 2.2 | 0.506 | 0.362 |
| 54 | 11.76 | 16.18 | 14.89 | 20.50 | 2.2 | 0.533 | 0.404 |
| 72 | 6.18 | 19.02 | 7.83 | 24.10 | 2.3 | 0.517 | 0.443 |
| 90 | 0.00 | 20.00 | 0.00 | 25.34 | 2.3 | 0.477 | 0.484 |
| 108 | –6.18 | 19.02 | –7.83 | 24.10 | 2.4 | 0.419 | 0.520 |
| 126 | –11.76 | 16.18 | –14.89 | 20.50 | 2.5 | 0.351 | 0.533 |
| 144 | –16.18 | 11.76 | –20.50 | 14.89 | 2.5 | 0.290 | 0.498 |
| 162 | –19.02 | 6.18 | –24.10 | 7.83 | 2.6 | 0.243 | 0.451 |
| 180 | –20.00 | 0.00 | –25.34 | 0.00 | 2.6 | 0.212 | 0.388 |
| 198 | –19.02 | –6.18 | –24.10 | –7.83 | 2.6 | 0.198 | 0.327 |
| 216 | –16.18 | –11.76 | –20.50 | –14.89 | 2.6 | 0.196 | 0.276 |
| 234 | –11.76 | –16.18 | –14.89 | –20.50 | 2.6 | 0.206 | 0.243 |
| 252 | –6.18 | –19.02 | –7.83 | –24.10 | 2.5 | 0.216 | 0.219 |
| 270 | 0.00 | –20.00 | 0.00 | –25.34 | 2.4 | 0.231 | 0.204 |
| 288 | 6.18 | –19.02 | 7.83 | –24.10 | 2.4 | 0.250 | 0.198 |
| 306 | 11.76 | –16.18 | 14.89 | –20.50 | 2.3 | 0.276 | 0.202 |
| 324 | 16.18 | –11.76 | 20.50 | –14.89 | 2.2 | 0.311 | 0.209 |
| 342 | 19.02 | –6.18 | 24.10 | –7.83 | 2.2 | 0.359 | 0.236 |
| $M' = 30;\ M = 43.06$ | | | | | | | |
| 0 | 30.00 | 0.00 | 43.06 | 0.00 | 2.0 | 0.479 | 0.241 |
| 18 | 28.53 | 9.27 | 40.95 | 13.31 | 2.0 | 0.568 | 0.302 |
| 36 | 24.27 | 17.63 | 34.84 | 25.31 | 2.1 | 0.610 | 0.350 |
| 54 | 17.63 | 24.27 | 25.31 | 34.84 | 2.1 | 0.628 | 0.371 |
| *72* | *9.27* | *28.53* | *13.31* | *40.95* | *2.2* | *0.590* | *0.411* |
| *90* | *0.00* | *30* | *0.00* | *43.06* | *2.3* | *0.530* | *0.472* |
| *108* | *–9.27* | *28.53* | *–13.31* | *40.95* | *2.4* | *0.447* | *0.552* |
| 126 | –17.63 | 24.27 | –25.31 | 34.84 | 2.6 | 0.344 | 0.645 |
| 144 | –24.27 | 17.63 | –34.84 | 25.31 | 2.7 | 0.244 | 0.644 |
| *162* | –28.53 | 9.27 | *–40.95* | *13.31* | *2.8* | *0.154* | *0.579* |
| *180* | –30.00 | 0.00 | *–43.06* | *0.00* | *2.8* | *0.112* | *0.448* |
| *198* | –28.53 | –9.27 | *–40.95* | *–13.31* | *2.9* | *0.110* | *0.317* |
| *216* | –24.27 | –17.63 | *–34.84* | *–25.31* | *2.9* | *0.125* | *0.223* |
| 234 | –17.63 | –24.27 | –25.31 | –34.84 | 2.7 | 0.154 | 0.180 |
| 252 | –9.27 | –28.53 | –13.31 | –40.95 | 2.6 | 0.173 | 0.148 |
| 270 | 0.00 | –30.00 | 0.00 | –43.06 | 2.5 | 0.192 | 0.132 |
| 288 | 9.27 | –28.53 | 13.31 | –40.95 | 2.4 | 0.217 | 0.126 |
| 306 | 17.63 | –24.27 | 25.31 | –34.84 | 2.2 | 0.250 | 0.132 |
| 324 | 24.27 | –17.63 | 34.84 | –25.31 | 2.1 | 0.296 | 0.139 |
| 342 | 28.53 | –9.27 | 40.95 | –13.31 | 2.0 | 0.377 | 0.181 |
| $M' = 40;\ M = 65.32$ | | | | | | | |
| *0* | *40.00* | *0.00* | *65.32* | *0.00* | *1.9* | *0.546* | *0.207* |
| 18 | 38.04 | 12.36 | 62.12 | 20.18 | 1.9 | 0.663 | 0.277 |
| 36 | 32.36 | 23.51 | 52.84 | 38.39 | 2.0 | 0.681 | 0.316 |
| 252 | –12.36 | –38.04 | –20.18 | –62.12 | 2.8 | 0.148 | 0.088 |
| *270* | *0.00* | *–40.00* | *0.00* | *–65.32* | *2.6* | *0.169* | *0.073* |
| *288* | *12.36* | *–38.04* | *20.18* | *–62.12* | *2.4* | *0.191* | *0.069* |
| *306* | *23.51* | *–32.36* | *38.39* | *–52.84* | *2.2* | *0.224* | *0.075* |
| *324* | *32.36* | *–23.51* | *52.84* | *–38.39* | *1.9* | *0.270* | *0.076* |
| *342* | *38.04* | *–12.36* | *62.12* | *–20.18* | *1.9* | *0.384* | *0.128* |
| $M' = 50;\ M = 93.28$ | | | | | | | |
| *306* | *0.00* | *0.00* | *54.83* | *–75.46* | *2.1* | *0.202* | *0.037* |

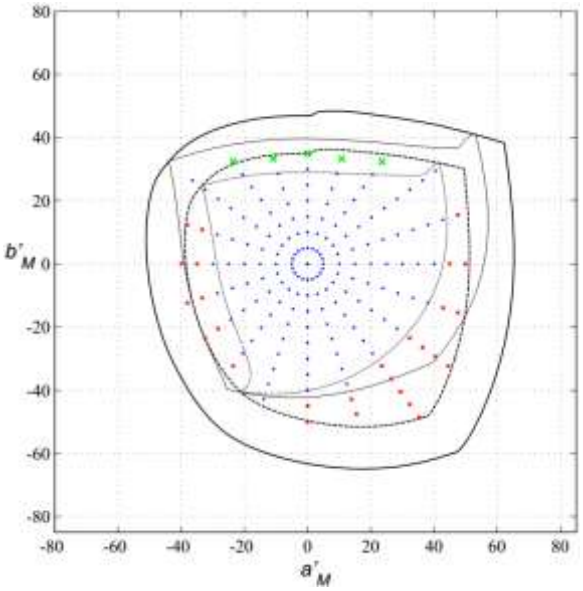


Figure 7 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 30$ on $a'_M, b'_M$ plane of the CAM02–UCS space

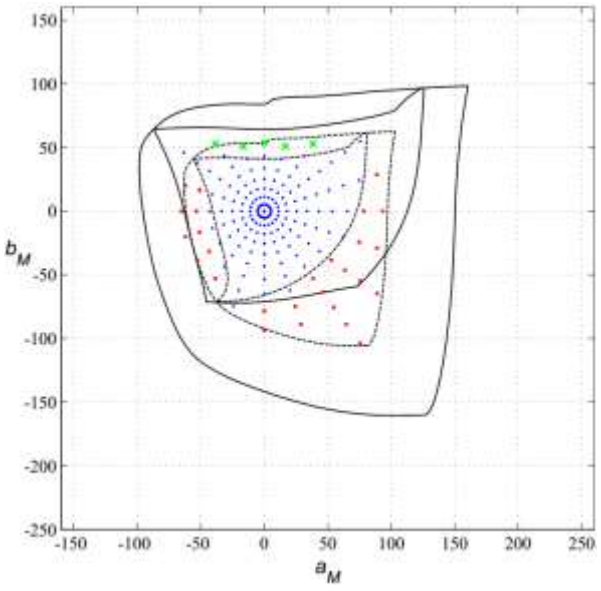


Figure 8 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 30$ on $a_M, b_M$ plane of the CIECAM02 space

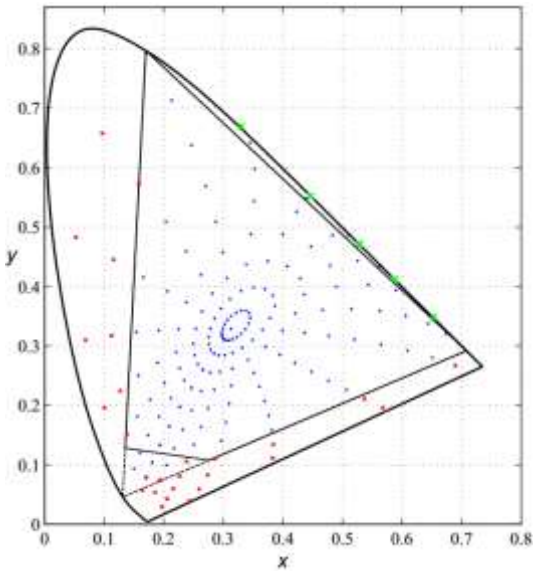


Figure 9 – Color points of existing colour gamut and of color gamut transmitted and reproduced by UHDTV system for $J' = 30$ on the $x, y$ plane of the CIE-31 space

Table 3 – Values of CAM02-UCS, CIECAM02 and $Y, x, y$ color grid nodes coordinates calculated for $J' = 30$ and corresponding $J = 20.13$

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| $M' = 10;\ M = 11.23$ | | | | | | | |
| 0 | 10.00 | 0.00 | 11.23 | 0.00 | 5.2 | 0.349 | 0.310 |
| 18 | 9.51 | 3.09 | 10.68 | 3.47 | 5.2 | 0.366 | 0.328 |
| 36 | 8.09 | 5.88 | 9.09 | 6.60 | 5.2 | 0.379 | 0.347 |
| 54 | 5.88 | 8.09 | 6.60 | 9.09 | 5.2 | 0.386 | 0.368 |
| 72 | 3.09 | 9.51 | 3.47 | 10.68 | 5.3 | 0.383 | 0.385 |
| 90 | 0.00 | 10.00 | 0.00 | 11.23 | 5.3 | 0.370 | 0.396 |
| 108 | –3.09 | 9.51 | –3.47 | 10.68 | 5.4 | 0.351 | 0.399 |
| 126 | –5.88 | 8.09 | –6.60 | 9.09 | 5.5 | 0.330 | 0.393 |
| 144 | –8.09 | 5.88 | –9.09 | 6.60 | 5.5 | 0.311 | 0.379 |
| 162 | –9.51 | 3.09 | –10.68 | 3.47 | 5.5 | 0.296 | 0.363 |
| 180 | –10.00 | 0.00 | –11.23 | 0.00 | 5.5 | 0.285 | 0.346 |
| 198 | –9.51 | –3.09 | –10.68 | –3.47 | 5.5 | 0.278 | 0.330 |
| 216 | –8.09 | –5.88 | –9.09 | –6.60 | 5.5 | 0.275 | 0.315 |
| 234 | –5.88 | –8.09 | –6.60 | –9.09 | 5.5 | 0.276 | 0.303 |
| 252 | –3.09 | –9.51 | –3.47 | –10.68 | 5.5 | 0.279 | 0.294 |
| 270 | 0.00 | –10.00 | 0.00 | –11.23 | 5.4 | 0.284 | 0.287 |
| 288 | 3.09 | –9.51 | 3.47 | –10.68 | 5.4 | 0.292 | 0.284 |
| 306 | 5.88 | –8.09 | 6.60 | –9.09 | 5.3 | 0.303 | 0.285 |
| 324 | 8.09 | –5.88 | 9.09 | –6.60 | 5.3 | 0.316 | 0.288 |
| 342 | 9.51 | –3.09 | 10.68 | –3.47 | 5.2 | 0.332 | 0.297 |

Table 3 (end)

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| $M' = 20$; $M = 25.34$ | | | | | | | |
| 0 | 20.00 | 0.00 | 25.34 | 0.00 | 5.0 | 0.394 | 0.285 |
| 18 | 19.02 | 6.18 | 24.10 | 7.83 | 5.0 | 0.436 | 0.322 |
| 36 | 16.18 | 11.76 | 20.50 | 14.89 | 5.0 | 0.467 | 0.361 |
| 54 | 11.76 | 16.18 | 14.89 | 20.50 | 5.0 | 0.490 | 0.400 |
| 72 | 6.18 | 19.02 | 7.83 | 24.10 | 5.1 | 0.479 | 0.436 |
| 90 | 0.00 | 20.00 | 0.00 | 25.34 | 5.3 | 0.447 | 0.467 |
| 108 | –6.18 | 19.02 | –7.83 | 24.10 | 5.4 | 0.400 | 0.488 |
| 126 | –11.76 | 16.18 | –14.89 | 20.50 | 5.6 | 0.346 | 0.488 |
| 144 | –16.18 | 11.76 | –20.50 | 14.89 | 5.7 | 0.299 | 0.458 |
| 162 | –19.02 | 6.18 | –24.10 | 7.83 | 5.7 | 0.262 | 0.420 |
| 180 | –20.00 | 0.00 | –25.34 | 0.00 | 5.8 | 0.238 | 0.374 |
| 198 | –19.02 | –6.18 | –24.10 | –7.83 | 5.8 | 0.225 | 0.328 |
| 216 | –16.18 | –11.76 | –20.50 | –14.89 | 5.7 | 0.221 | 0.290 |
| 234 | –11.76 | –16.18 | –14.89 | –20.50 | 5.7 | 0.227 | 0.263 |
| 252 | –6.18 | –19.02 | –7.83 | –24.10 | 5.6 | 0.234 | 0.242 |
| 270 | 0.00 | –20.00 | 0.00 | –25.34 | 5.5 | 0.246 | 0.230 |
| 288 | 6.18 | –19.02 | 7.83 | –24.10 | 5.4 | 0.263 | 0.224 |
| 306 | 11.76 | –16.18 | 14.89 | –20.50 | 5.2 | 0.285 | 0.226 |
| 324 | 16.18 | –11.76 | 20.50 | –14.89 | 5.1 | 0.313 | 0.233 |
| 342 | 19.02 | –6.18 | 24.10 | –7.83 | 5.0 | 0.351 | 0.255 |
| $M' = 30$; $M = 43.06$ | | | | | | | |
| 0 | 30.00 | 0.00 | 43.06 | 0.00 | 4.7 | 0.448 | 0.257 |
| 18 | 28.53 | 9.27 | 40.95 | 13.31 | 4.7 | 0.520 | 0.311 |
| 36 | 24.27 | 17.63 | 34.84 | 25.31 | 4.8 | 0.562 | 0.359 |
| 54 | 17.63 | 24.27 | 25.31 | 34.84 | 4.8 | 0.590 | 0.394 |
| 72 | 9.27 | 28.53 | 13.31 | 40.95 | 5.0 | 0.562 | 0.434 |
| 90 | 0.00 | 30.00 | 0.00 | 43.06 | 5.2 | 0.510 | 0.486 |
| 108 | –9.27 | 28.53 | –13.31 | 40.95 | 5.5 | 0.439 | 0.549 |
| 126 | –17.63 | 24.27 | –25.31 | 34.84 | 5.7 | 0.352 | 0.598 |
| 144 | –24.27 | 17.63 | –34.84 | 25.31 | 5.9 | 0.271 | 0.569 |
| 162 | –28.53 | 9.27 | –40.95 | 13.31 | 6.0 | 0.204 | 0.509 |
| 180 | –30.00 | 0.00 | –43.06 | 0.00 | 6.1 | 0.166 | 0.416 |
| 198 | –28.53 | –9.27 | –40.95 | –13.31 | 6.2 | 0.154 | 0.323 |
| 216 | –24.27 | –17.63 | –34.84 | –25.31 | 6.1 | 0.158 | 0.250 |
| 234 | –17.63 | –24.27 | –25.31 | –34.84 | 5.9 | 0.177 | 0.210 |
| 252 | –9.27 | –28.53 | –13.31 | –40.95 | 5.8 | 0.191 | 0.181 |
| 252 | –9.27 | –28.53 | –13.31 | –40.95 | 5.8 | 0.191 | 0.181 |
| 270 | 0.00 | –30.00 | 0.00 | –43.06 | 5.6 | 0.209 | 0.165 |
| 288 | 9.27 | –28.53 | 13.31 | –40.95 | 5.3 | 0.232 | 0.159 |
| 306 | 17.63 | –24.27 | 25.31 | –34.84 | 5.1 | 0.263 | 0.164 |
| 324 | 24.27 | –17.63 | 34.84 | –25.31 | 4.9 | 0.304 | 0.172 |
| 342 | 28.53 | –9.27 | 40.95 | –13.31 | 4.8 | 0.369 | 0.208 |
| $M' = 40$; $M = 65.32$ | | | | | | | |
| 0 | 40.00 | 0.00 | 65.32 | 0.00 | 4.4 | 0.506 | 0.226 |
| 18 | 38.04 | 12.36 | 62.12 | 20.18 | 4.4 | 0.609 | 0.292 |
| 36 | 32.36 | 23.51 | 52.84 | 38.39 | 4.6 | 0.644 | 0.338 |
| *54* | *23.51* | *32.36* | *38.39* | *52.84* | *4.6* | *0.653* | *0.348* |
| *126* | *–23.51* | *32.36* | *–38.39* | *52.84* | *5.9* | *0.330* | *0.669* |
| 144 | –32.36 | 23.51 | –52.84 | 38.39 | 6.1 | 0.213 | 0.713 |
| *162* | *–38.04* | *12.36* | *–62.12* | *20.18* | *6.4* | *0.097* | *0.658* |
| *180* | *–40.00* | *0.00* | *–65.32* | *0.00* | *6.7* | *0.053* | *0.483* |
| *198* | *–38.04* | *–12.36* | *–62.12* | *–20.18* | *6.8* | *0.069* | *0.310* |
| *216* | *–32.36* | *–23.51* | *–52.84* | *–38.39* | *6.8* | *0.100* | *0.196* |
| *234* | *–23.51* | *–32.36* | *–38.39* | *–52.84* | *6.4* | *0.138* | *0.152* |
| 252 | –12.36 | –38.04 | –20.18 | –62.12 | 6.1 | 0.160 | 0.120 |
| 270 | 0.00 | –40.00 | 0.00 | –65.32 | 5.7 | 0.180 | 0.104 |
| 270 | 0.00 | –40.00 | 0.00 | –65.32 | 5.7 | 0.180 | 0.104 |
| 288 | 12.36 | –38.04 | 20.18 | –62.12 | 5.3 | 0.205 | 0.100 |
| *306* | *23.51* | *–32.36* | *38.39* | *–52.84* | *5.0* | *0.238* | *0.106* |
| *324* | *32.36* | *–23.51* | *52.84* | *–38.39* | *4.6* | *0.286* | *0.111* |
| 342 | 38.04 | –12.36 | 62.12 | –20.18 | 4.4 | 0.381 | 0.158 |
| $M' = 50$; $M = 93.28$ | | | | | | | |
| *0* | *50.00* | *0.00* | *93.28* | *0.00* | *4.1* | *0.568* | *0.196* |
| *18* | *47.55* | *15.45* | *88.71* | *28.82* | *4.2* | *0.689* | *0.267* |
| 36 | 40.45 | 29.39 | 75.46 | 54.83 | 4.4 | 0.696 | 0.303 |
| *270* | *0.00* | *–50.00* | *0.00* | *–93.28* | *6.0* | *0.164* | *0.058* |
| *288* | *15.45* | *–47.55* | *28.82* | *–88.71* | *5.4* | *0.185* | *0.054* |
| *306* | *29.39* | *–40.45* | *54.83* | *–75.46* | *4.8* | *0.216* | *0.060* |
| *324* | *40.45* | *–29.39* | *75.46* | *–54.83* | *4.2* | *0.259* | *0.059* |
| *342* | *47.55* | *–15.45* | *88.71* | *–28.82* | *4.1* | *0.383* | *0.112* |
| $M' = 60$; $M = 128.4$ | | | | | | | |
| *306* | *35.27* | *–48.54* | *75.47* | *–103.88* | *4.6* | *0.197* | *0.030* |

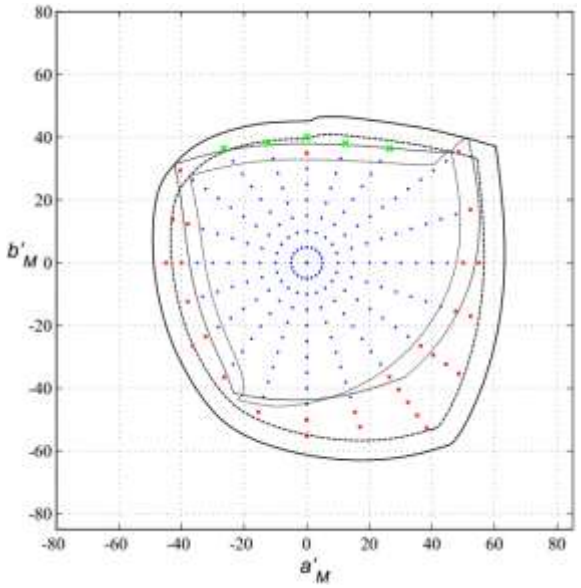


Figure 10 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 40$ on $a'_M, b'_M$ plane of the CAM02-UCS space

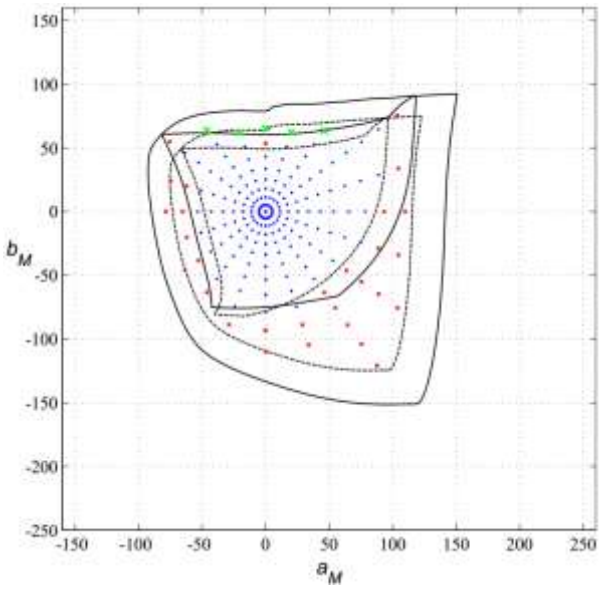


Figure 11 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 40$ on $a_M, b_M$ plane of the CIECAM02 space

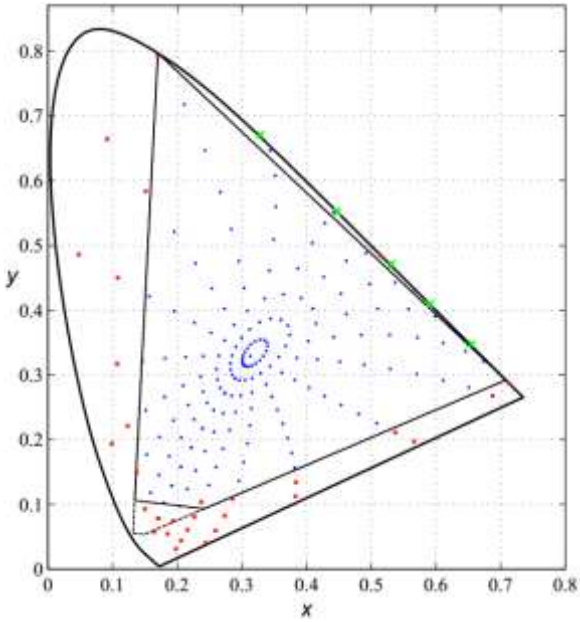


Figure 12 – Color points of existing colour gamut and of color gamut transmitted and reproduced by UHDTV system for $J' = 40$ on the $x, y$ plane of the CIE-31 space

Table 4 – Values of CAM02-UCS, CIECAM02 and $Y, x, y$ color grid nodes coordinates calculated for $J' = 40$ and corresponding $J = 28.17$

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| $M' = 10$; $M = 11.23$ | | | | | | | |
| 0 | 10.00 | 0.00 | 11.23 | 0.00 | 9.6 | 0.343 | 0.314 |
| 18 | 9.51 | 3.09 | 10.68 | 3.47 | 9.6 | 0.357 | 0.328 |
| 36 | 8.09 | 5.88 | 9.09 | 6.60 | 9.6 | 0.368 | 0.345 |
| 54 | 5.88 | 8.09 | 6.60 | 9.09 | 9.6 | 0.374 | 0.362 |
| 72 | 3.09 | 9.51 | 3.47 | 10.68 | 9.7 | 0.371 | 0.376 |
| 90 | 0.00 | 10.00 | 0.00 | 11.23 | 9.8 | 0.360 | 0.385 |
| 108 | –3.09 | 9.51 | –3.47 | 10.68 | 9.9 | 0.344 | 0.387 |
| 126 | –5.88 | 8.09 | –6.60 | 9.09 | 10.0 | 0.327 | 0.381 |
| 144 | –8.09 | 5.88 | –9.09 | 6.60 | 10.1 | 0.312 | 0.370 |
| 162 | –9.51 | 3.09 | –10.68 | 3.47 | 10.1 | 0.299 | 0.357 |
| 180 | –10.00 | 0.00 | –11.23 | 0.00 | 10.1 | 0.290 | 0.343 |
| 198 | –9.51 | –3.09 | –10.68 | –3.47 | 10.1 | 0.285 | 0.330 |
| 216 | –8.09 | –5.88 | –9.09 | –6.60 | 10.1 | 0.282 | 0.318 |
| 234 | –5.88 | –8.09 | –6.60 | –9.09 | 10.0 | 0.282 | 0.308 |
| 252 | –3.09 | –9.51 | –3.47 | –10.68 | 10.0 | 0.285 | 0.300 |
| 270 | 0.00 | –10.00 | 0.00 | –11.23 | 9.9 | 0.289 | 0.295 |
| 288 | 3.09 | –9.51 | 3.47 | –10.68 | 9.9 | 0.296 | 0.292 |
| 306 | 5.88 | –8.09 | 6.60 | –9.09 | 9.8 | 0.305 | 0.292 |
| 324 | 8.09 | –5.88 | 9.09 | –6.60 | 9.7 | 0.316 | 0.295 |
| 342 | 9.51 | –3.09 | 10.68 | –3.47 | 9.7 | 0.329 | 0.302 |
| $M' = 20$; $M = 25.34$ | | | | | | | |
| 0 | 20.00 | 0.00 | 25.34 | 0.00 | 9.3 | 0.382 | 0.292 |
| 18 | 19.02 | 6.18 | 24.10 | 7.83 | 9.2 | 0.416 | 0.324 |
| 36 | 16.18 | 11.76 | 20.50 | 14.89 | 9.3 | 0.442 | 0.358 |
| 54 | 11.76 | 16.18 | 14.89 | 20.50 | 9.3 | 0.461 | 0.394 |
| 72 | 6.18 | 19.02 | 7.83 | 24.10 | 9.5 | 0.453 | 0.426 |
| 90 | 0.00 | 20.00 | 0.00 | 25.34 | 9.7 | 0.426 | 0.451 |
| 108 | –6.18 | 19.02 | –7.83 | 24.10 | 10.0 | 0.386 | 0.465 |
| 126 | –11.76 | 16.18 | –14.89 | 20.50 | 10.2 | 0.342 | 0.461 |
| 144 | –16.18 | 11.76 | –20.50 | 14.89 | 10.3 | 0.303 | 0.434 |
| 162 | –19.02 | 6.18 | –24.10 | 7.83 | 10.4 | 0.273 | 0.402 |
| 180 | –20.00 | 0.00 | –25.34 | 0.00 | 10.5 | 0.252 | 0.365 |
| 198 | –19.02 | –6.18 | –24.10 | –7.83 | 10.5 | 0.240 | 0.329 |
| 216 | –16.18 | –11.76 | –20.50 | –14.89 | 10.4 | 0.236 | 0.297 |
| 234 | –11.76 | –16.18 | –14.89 | –20.50 | 10.3 | 0.240 | 0.274 |
| 252 | –6.18 | –19.02 | –7.83 | –24.10 | 10.2 | 0.246 | 0.257 |
| 270 | 0.00 | –20.00 | 0.00 | –25.34 | 10.0 | 0.256 | 0.246 |
| 288 | 6.18 | –19.02 | 7.83 | –24.10 | 9.8 | 0.271 | 0.241 |
| 306 | 11.76 | –16.18 | 14.89 | –20.50 | 9.7 | 0.290 | 0.242 |
| 324 | 16.18 | –11.76 | 20.50 | –14.89 | 9.5 | 0.314 | 0.248 |
| 342 | 19.02 | –6.18 | 24.10 | –7.83 | 9.3 | 0.346 | 0.266 |
| $M' = 30$; $M = 43.06$ | | | | | | | |
| 0 | 30.00 | 0.00 | 43.06 | 0.00 | 8.8 | 0.428 | 0.267 |
| 18 | 28.53 | 9.27 | 40.95 | 13.31 | 8.8 | 0.489 | 0.316 |
| 36 | 24.27 | 17.63 | 34.84 | 25.31 | 8.9 | 0.529 | 0.362 |
| 54 | 17.63 | 24.27 | 25.31 | 34.84 | 9.0 | 0.557 | 0.402 |
| 72 | 9.27 | 28.53 | 13.31 | 40.95 | 9.3 | 0.537 | 0.442 |
| 90 | 0.00 | 30.00 | 0.00 | 43.06 | 9.6 | 0.492 | 0.488 |
| 108 | –9.27 | 28.53 | –13.31 | 40.95 | 10.0 | 0.428 | 0.534 |
| 126 | –17.63 | 24.27 | –25.31 | 34.84 | 10.4 | 0.353 | 0.560 |
| 144 | –24.27 | 17.63 | –34.84 | 25.31 | 10.6 | 0.283 | 0.525 |
| 162 | –28.53 | 9.27 | –40.95 | 13.31 | 10.9 | 0.228 | 0.472 |
| 180 | –30.00 | 0.00 | –43.06 | 0.00 | 11.0 | 0.195 | 0.398 |
| 198 | –28.53 | –9.27 | –40.95 | –13.31 | 11.0 | 0.181 | 0.326 |
| 216 | –24.27 | –17.63 | –34.84 | –25.31 | 11.0 | 0.180 | 0.266 |
| 234 | –17.63 | –24.27 | –25.31 | –34.84 | 10.7 | 0.194 | 0.230 |
| 252 | –9.27 | –28.53 | –13.31 | –40.95 | 10.4 | 0.206 | 0.203 |
| 270 | 0.00 | –30.00 | 0.00 | –43.06 | 10.1 | 0.222 | 0.188 |
| 288 | 9.27 | –28.53 | 13.31 | –40.95 | 9.8 | 0.243 | 0.182 |
| 306 | 17.63 | –24.27 | 25.31 | –34.84 | 9.5 | 0.271 | 0.186 |
| 324 | 24.27 | –17.63 | 34.84 | –25.31 | 9.2 | 0.308 | 0.194 |
| 342 | 28.53 | –9.27 | 40.95 | –13.31 | 8.9 | 0.363 | 0.225 |

Table 4 (end)

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| $M' = 40$; $M = 65.32$ | | | | | | | |
| 0 | 40.00 | 0.00 | 65.32 | 0.00 | 8.3 | 0.480 | 0.240 |
| 18 | 38.04 | 12.36 | 62.12 | 20.18 | 8.4 | 0.570 | 0.301 |
| 36 | 32.36 | 23.51 | 52.84 | 38.39 | 8.5 | 0.611 | 0.349 |
| 54 | 23.51 | 32.36 | 38.39 | 52.84 | 8.7 | 0.629 | 0.370 |
| *72* | *12.36* | *38.04* | *20.18* | *62.12* | *9.1* | *0.591* | *0.410* |
| *90* | *0.00* | *40.00* | *0.00* | *65.32* | *9.6* | *0.531* | *0.471* |
| *108* | *–12.36* | *38.04* | *–20.18* | *62.12* | *10.1* | *0.448* | *0.552* |
| 126 | –23.51 | 32.36 | –38.39 | 52.84 | 10.7 | 0.343 | 0.646 |
| 144 | –32.36 | 23.51 | –52.84 | 38.39 | 11.0 | 0.243 | 0.647 |
| *162* | *–38.04* | *12.36* | *–62.12* | *20.18* | *11.5* | *0.151* | *0.584* |
| *180* | *–40.00* | *0.00* | *–65.32* | *0.00* | *11.8* | *0.108* | *0.450* |
| *198* | *–38.04* | *–12.36* | *–62.12* | *–20.18* | *11.9* | *0.107* | *0.317* |
| *216* | *–32.36* | *–23.51* | *–52.84* | *–38.39* | *11.9* | *0.123* | *0.221* |
| 234 | –23.51 | –32.36 | –38.39 | –52.84 | 11.3 | 0.153 | 0.177 |
| 252 | –12.36 | –38.04 | –20.18 | –62.12 | 10.9 | 0.172 | 0.146 |
| 270 | 0.00 | –40.00 | 0.00 | –65.32 | 10.4 | 0.191 | 0.129 |
| 288 | 12.36 | –38.04 | 20.18 | –62.12 | 9.8 | 0.216 | 0.124 |
| 306 | 23.51 | –32.36 | 38.39 | –52.84 | 9.3 | 0.249 | 0.130 |
| 324 | 32.36 | –23.51 | 52.84 | –38.39 | 8.7 | 0.295 | 0.136 |
| 342 | 38.04 | –12.36 | 62.12 | –20.18 | 8.4 | 0.377 | 0.180 |
| $M' = 50$; $M = 93.28$ | | | | | | | |
| *0* | *50.00* | *0.00* | *93.28* | *0.00* | *7.8* | *0.537* | *0.211* |
| 18 | 47.55 | 15.45 | 88.71 | 28.82 | 7.9 | 0.651 | 0.280 |
| 36 | 40.45 | 29.39 | 75.46 | 54.83 | 8.2 | 0.674 | 0.321 |
| *144* | *–40.45* | *29.39* | *–75.46* | *54.83* | *11.5* | *0.170* | *0.792* |
| *252* | *–15.45* | *–47.55* | *–28.82* | *–88.71* | *11.7* | *0.150* | *0.093* |
| *270* | *0.00* | *–50.00* | *0.00* | *–93.28* | *10.8* | *0.171* | *0.078* |
| *270* | *0.00* | *–55.00* | *0.00* | *–109.84* | *11.1* | *0.164* | *0.058* |
| *288* | *15.45* | *–47.55* | *28.82* | *–88.71* | *9.8* | *0.194* | *0.074* |
| *306* | *29.39* | *–40.45* | *54.83* | *–75.46* | *9.0* | *0.226* | *0.081* |
| *324* | *40.45* | *–29.39* | *75.46* | *–54.83* | *8.1* | *0.273* | *0.083* |
| *342* | *47.55* | *–15.45* | *88.71* | *–28.82* | *7.8* | *0.384* | *0.134* |
| $M' = 60$; $M = 128.4$ | | | | | | | |
| *324* | *48.54* | *–35.27* | *103.88* | *–75.47* | *7.4* | *0.244* | *0.041* |
| *306* | *35.27* | *–48.54* | *75.47* | *–103.88* | *8.7* | *0.206* | *0.044* |

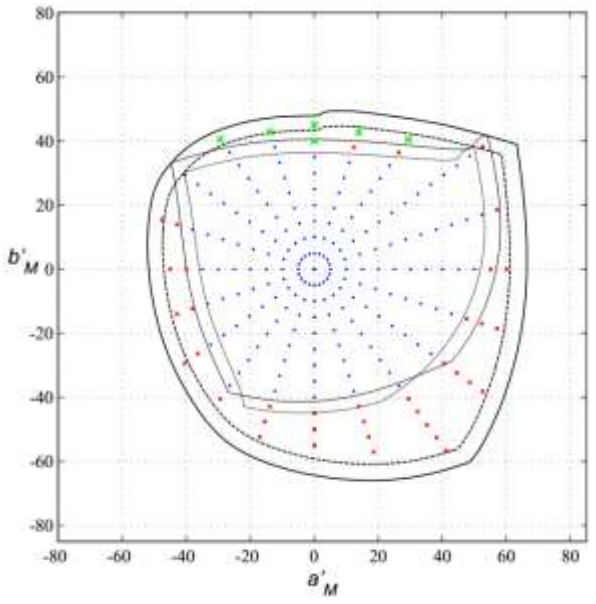


Figure 13 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 50$ on $a'_M, b'_M$ plane of the CAM02–UCS space

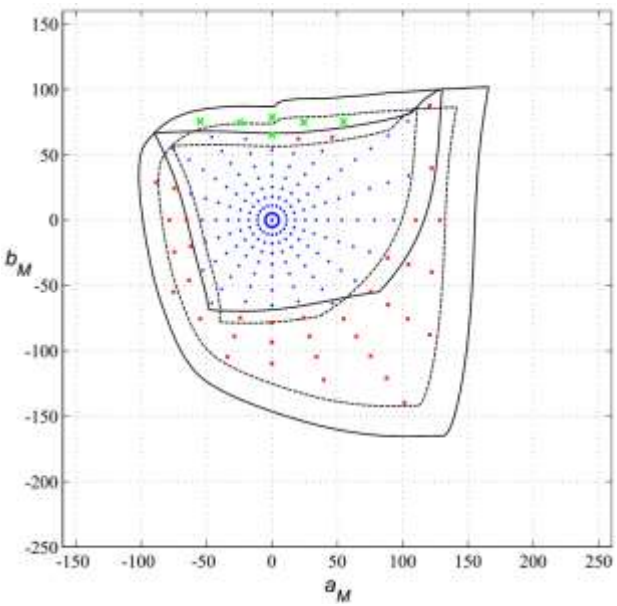


Figure 14 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 50$ on $a_M, b_M$ plane of the CIECAM02 space

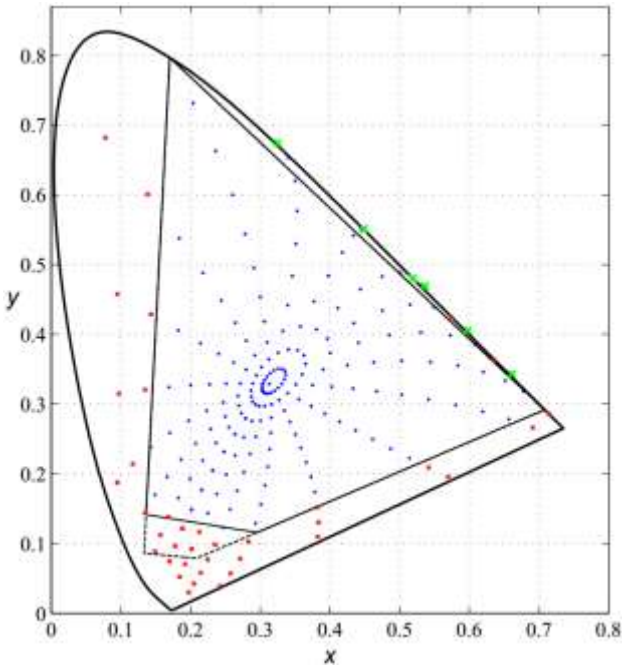


Figure 15 – Color points of existing colour gamut and of color gamut transmitted and reproduced by UHDTV system for $J' = 50$ on the $x, y$ plane of the CIE-31 space

Table 5 – Values of CAM02-UCS, CIECAM02 and $Y, x, y$ color grid nodes coordinates calculated for $J' = 50$ and corresponding $J = 37.03$

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| $M' = 10;\ M = 11.23$ | | | | | | | |
| 0 | 10.00 | 0.00 | 11.23 | 0.00 | 15.8 | 0.339 | 0.315 |
| 18 | 9.51 | 3.09 | 10.68 | 3.47 | 15.8 | 0.351 | 0.328 |
| 36 | 8.09 | 5.87 | 9.08 | 6.60 | 15.8 | 0.360 | 0.342 |
| 54 | 5.87 | 8.09 | 6.60 | 9.08 | 15.8 | 0.365 | 0.357 |
| 72 | 3.09 | 9.51 | 3.47 | 10.68 | 16.0 | 0.362 | 0.369 |
| 90 | 0.00 | 10.00 | 0.00 | 11.23 | 16.1 | 0.353 | 0.377 |
| 108 | –3.09 | 9.51 | –3.47 | 10.68 | 16.2 | 0.340 | 0.378 |
| 126 | –5.87 | 8.09 | –6.60 | 9.08 | 16.4 | 0.325 | 0.373 |
| 144 | –8.09 | 5.87 | –9.08 | 6.60 | 16.4 | 0.312 | 0.364 |
| 162 | –9.51 | 3.09 | –10.68 | 3.47 | 16.5 | 0.301 | 0.353 |
| 180 | –10 | 0.00 | –11.23 | 0.00 | 16.5 | 0.294 | 0.341 |
| 198 | –9.51 | –3.09 | –10.68 | –3.47 | 16.5 | 0.289 | 0.329 |
| 216 | –8.09 | –5.87 | –9.08 | –6.60 | 16.5 | 0.286 | 0.319 |
| 234 | –5.87 | –8.09 | –6.60 | –9.08 | 16.4 | 0.286 | 0.310 |
| 252 | –3.09 | –9.51 | –3.47 | –10.68 | 16.3 | 0.288 | 0.304 |
| 270 | 0.00 | –10.00 | 0.00 | –11.23 | 16.3 | 0.292 | 0.299 |
| 288 | 3.09 | –9.51 | 3.47 | –10.68 | 16.2 | 0.298 | 0.297 |
| 306 | 5.87 | –8.09 | 6.60 | –9.08 | 16.1 | 0.306 | 0.297 |
| 324 | 8.09 | –5.87 | 9.08 | –6.60 | 16.0 | 0.315 | 0.299 |
| 342 | 9.51 | –3.09 | 10.68 | –3.47 | 15.9 | 0.327 | 0.306 |
| $M' = 20;\ M = 25.33$ | | | | | | | |
| 0 | 20.00 | 0.00 | 25.33 | 0.00 | 15.3 | 0.372 | 0.297 |
| 18 | 19.02 | 6.18 | 24.09 | 7.83 | 15.2 | 0.402 | 0.325 |
| 36 | 16.18 | 11.75 | 20.50 | 14.89 | 15.3 | 0.424 | 0.355 |
| 54 | 11.75 | 16.18 | 14.89 | 20.50 | 15.4 | 0.440 | 0.388 |
| 72 | 6.18 | 19.02 | 7.83 | 24.09 | 15.7 | 0.434 | 0.416 |
| 90 | 0.00 | 20.00 | 0.00 | 25.33 | 16.0 | 0.410 | 0.437 |
| 108 | –6.18 | 19.02 | –7.83 | 24.09 | 16.3 | 0.376 | 0.447 |
| 126 | –11.75 | 16.18 | –14.89 | 20.50 | 16.6 | 0.339 | 0.441 |
| 144 | –16.18 | 11.75 | –20.50 | 14.89 | 16.8 | 0.305 | 0.418 |
| 162 | –19.02 | 6.18 | –24.09 | 7.83 | 16.9 | 0.279 | 0.391 |
| 180 | –20.00 | 0.00 | –25.33 | 0.00 | 17.0 | 0.261 | 0.359 |
| 198 | –19.02 | –6.18 | –24.09 | –7.83 | 17.0 | 0.250 | 0.329 |
| 216 | –16.18 | –11.75 | –20.50 | –14.89 | 16.9 | 0.246 | 0.302 |
| 234 | –11.75 | –16.18 | –14.89 | –20.50 | 16.8 | 0.249 | 0.282 |
| 252 | –6.18 | –19.02 | –7.83 | –24.09 | 16.6 | 0.254 | 0.267 |
| 270 | 0.00 | –20.00 | 0.00 | –25.33 | 16.4 | 0.263 | 0.256 |
| 288 | 6.18 | –19.02 | 7.83 | –24.09 | 16.1 | 0.276 | 0.252 |
| 306 | 11.75 | –16.18 | 14.89 | –20.50 | 15.9 | 0.293 | 0.253 |
| 324 | 16.18 | –11.75 | 20.50 | –14.89 | 15.6 | 0.314 | 0.259 |
| 342 | 19.02 | –6.18 | 24.09 | –7.83 | 15.4 | 0.342 | 0.274 |
| $M' = 30;\ M = 43.06$ | | | | | | | |
| 0 | 30.00 | 0.00 | 43.06 | 0.00 | 14.6 | 0.413 | 0.274 |
| 18 | 28.53 | 9.27 | 40.95 | 13.30 | 14.6 | 0.466 | 0.318 |
| 36 | 24.27 | 17.63 | 34.83 | 25.31 | 14.7 | 0.502 | 0.362 |
| 54 | 17.63 | 24.27 | 25.31 | 34.83 | 14.9 | 0.530 | 0.403 |
| 72 | 9.27 | 28.53 | 13.30 | 40.95 | 15.3 | 0.514 | 0.442 |
| 90 | 0.00 | 30.00 | 0.00 | 43.06 | 15.8 | 0.474 | 0.483 |
| 108 | –9.27 | 28.53 | –13.30 | 40.95 | 16.4 | 0.417 | 0.517 |
| 126 | –17.63 | 24.27 | –25.31 | 34.83 | 16.9 | 0.350 | 0.530 |
| 144 | –24.27 | 17.63 | –34.83 | 25.31 | 17.3 | 0.290 | 0.495 |
| 162 | –28.53 | 9.27 | –40.95 | 13.30 | 17.6 | 0.243 | 0.448 |
| 180 | –30.00 | 0.00 | –43.06 | 0.00 | 17.7 | 0.213 | 0.387 |
| 198 | –28.53 | –9.27 | –40.95 | –13.30 | 17.8 | 0.199 | 0.326 |
| 216 | –24.27 | –17.63 | –34.83 | –25.31 | 17.6 | 0.197 | 0.276 |

Table 5 (end)

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| 234 | –17.63 | –24.27 | –25.31 | –34.83 | 17.3 | 0.207 | 0.243 |
| 252 | –9.27 | –28.53 | –13.30 | –40.95 | 17.0 | 0.217 | 0.219 |
| 270 | 0.00 | –30.00 | 0.00 | –43.06 | 16.5 | 0.231 | 0.204 |
| 288 | 9.27 | –28.53 | 13.30 | –40.95 | 16.1 | 0.250 | 0.199 |
| 306 | 17.63 | –24.27 | 25.31 | –34.83 | 15.6 | 0.276 | 0.202 |
| 324 | 24.27 | –17.63 | 34.83 | –25.31 | 15.2 | 0.310 | 0.210 |
| 342 | 28.53 | –9.27 | 40.95 | –13.30 | 14.8 | 0.358 | 0.237 |
| $M' = 40$; $M = 65.32$ | | | | | | | |
| 0 | 40.00 | 0.00 | 65.32 | 0.00 | 13.9 | 0.460 | 0.249 |
| 18 | 38.04 | 12.36 | 62.12 | 20.18 | 13.9 | 0.541 | 0.306 |
| 36 | 32.36 | 23.51 | 52.84 | 38.39 | 14.2 | 0.583 | 0.355 |
| 54 | 23.51 | 32.36 | 38.39 | 52.84 | 14.4 | 0.608 | 0.385 |
| *72* | *12.36* | *38.04* | *20.18* | *62.12* | *15.0* | *0.574* | *0.424* |
| *90* | *0.00* | *40.00* | *0.00* | *65.32* | *15.7* | *0.518* | *0.480* |
| 108 | –12.36 | 38.04 | –20.18 | 62.123 | 16.5 | 0.443 | 0.552 |
| 126 | –23.51 | 32.36 | –38.39 | 52.84 | 17.3 | 0.349 | 0.620 |
| 144 | –32.36 | 23.51 | –52.84 | 38.39 | 17.8 | 0.260 | 0.600 |
| 162 | –38.04 | 12.36 | –62.12 | 20.18 | 18.4 | 0.183 | 0.537 |
| *180* | *–40.00* | *0.00* | *–65.33* | *0.00* | *18.8* | *0.143* | *0.429* |
| *198* | *–38.04* | *–12.36* | *–62.12* | *–20.18* | *18.9* | *0.134* | *0.320* |
| 216 | –32.36 | –23.51 | –52.84 | –38.39 | 18.8 | 0.142 | 0.238 |
| 234 | –23.51 | –32.36 | –38.39 | –52.84 | 18.1 | 0.166 | 0.195 |
| 252 | –12.36 | –38.04 | –20.18 | –62.12 | 17.5 | 0.182 | 0.165 |
| 270 | 0.00 | –40.00 | 0.00 | –65.32 | 16.8 | 0.201 | 0.148 |
| 288 | 12.36 | –38.04 | 20.18 | –62.12 | 16.1 | 0.224 | 0.143 |
| 306 | 23.51 | –32.36 | 38.39 | –52.84 | 15.3 | 0.256 | 0.149 |
| 324 | 32.36 | –23.51 | 52.84 | –38.39 | 14.5 | 0.300 | 0.156 |
| 342 | 38.04 | –12.36 | 62.12 | –20.18 | 14.1 | 0.372 | 0.195 |

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| $M' = 50$; $M = 93.27$ | | | | | | | |
| 0 | 50.00 | 0.00 | 93.27 | 0.00 | 13.1 | 0.513 | 0.222 |
| 18 | 47.55 | 15.45 | 88.71 | 28.82 | 13.3 | 0.619 | 0.289 |
| 36 | 40.45 | 29.38 | 75.46 | 54.82 | 13.6 | 0.651 | 0.333 |
| *54* | *29.38* | *40.45* | *54.82* | *75.46* | *13.9* | *0.661* | *0.343* |
| *126* | *–29.38* | *40.45* | *–54.82* | *75.46* | *17.8* | *0.324* | *0.674* |
| 144 | –40.45 | 29.38 | –75.46 | 54.82 | 18.5 | 0.203 | 0.731 |
| *162* | *–47.55* | *15.45* | *–88.71* | *28.82* | *19.5* | *0.077* | *0.682* |
| *216* | *–40.45* | *–29.38* | *–75.46* | *–54.82* | *20.9* | *0.094* | *0.187* |
| *234* | *–29.38* | *–40.45* | *–54.82* | *–75.46* | *19.5* | *0.134* | *0.144* |
| *252* | *–15.45* | *–47.55* | *–28.82* | *–88.71* | *18.5* | *0.156* | *0.112* |
| *270* | *0.00* | *–50.00* | *0.00* | *–93.27* | *17.3* | *0.177* | *0.096* |
| *288* | *15.45* | *–47.55* | *28.82* | *–88.71* | *16.1* | *0.201* | *0.092* |
| *306* | *29.38* | *–40.45* | *54.82* | *–75.46* | *14.9* | *0.235* | *0.099* |
| *324* | *40.45* | *–29.38* | *75.46* | *–54.82* | *13.7* | *0.282* | *0.102* |
| *342* | *47.55* | *–15.45* | *88.71* | *–28.82* | *13.2* | *0.381* | *0.152* |
| $M' = 60$; $M = 128.39$ | | | | | | | |
| *0* | *60.00* | *0.00* | *128.39* | *0.00* | *12.3* | *0.569* | *0.195* |
| *18* | *57.06* | *18.54* | *122.11* | *39.67* | *12.6* | *0.690* | *0.266* |
| 36 | 48.54 | 35.260 | 103.87 | 75.47 | 13.2 | 0.697 | 0.301 |
| *288* | *18.54* | *–57.06* | *39.67* | *–122.11* | *16.2* | *0.184* | *0.052* |
| *306* | *35.26* | *–48.54* | *75.47* | *–103.87* | *14.4* | *0.214* | *0.058* |
| *324* | *48.54* | *–35.26* | *103.87* | *–75.47* | *12.7* | *0.257* | *0.057* |
| *342* | *57.06* | *–18.54* | *122.11* | *–39.67* | *12.2* | *0.382* | *0.110* |
| $M' = 70$; $M = 172.51$ | | | | | | | |
| *306* | *41.14* | *–56.63* | *101.39* | *–139.56* | *14.0* | *0.197* | *0.030* |

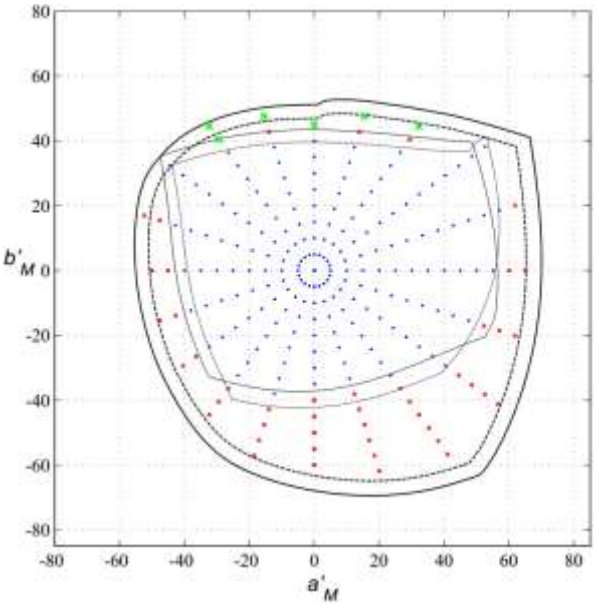


Figure 16 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 60$ on $a'_M, b'_M$ plane of the CAM02–UCS space

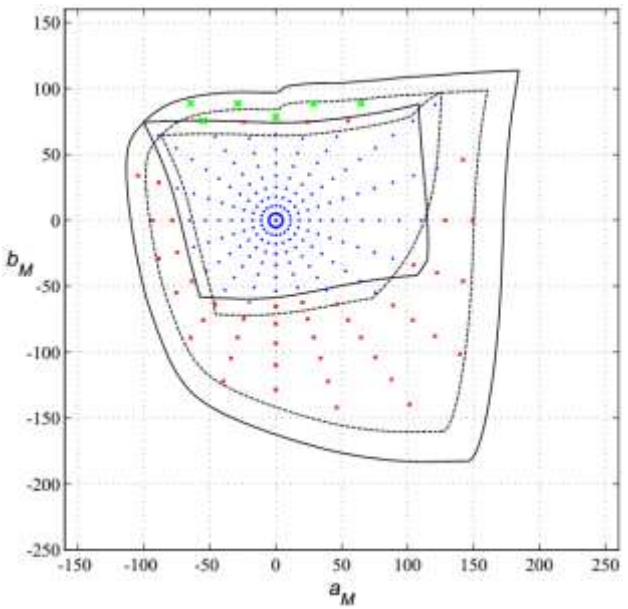


Figure 17 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 60$ on $a_M, b_M$ plane of the CIECAM02 space

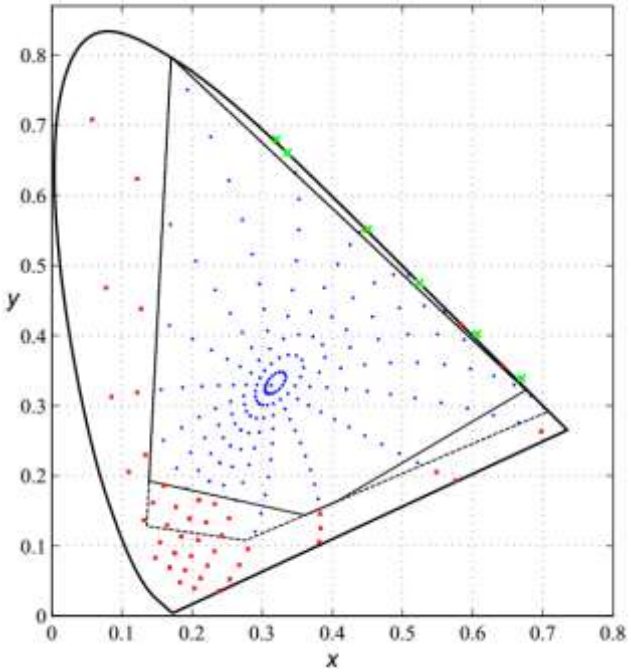


Figure 18 – Color points of existing colour gamut and of color gamut transmitted and reproduced by UHDTV system for $J' = 60$ on the $x, y$ plane of the CIE-31 space

Table 6 – Values of CAM02-UCS, CIECAM02 and $Y, x, y$ color grid nodes coordinates calculated for $J' = 60$ and corresponding $J = 46.88$

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| $M' = 10;\ M = 11.23$ | | | | | | | |
| 0 | 10.00 | 0.00 | 11.23 | 0.00 | 24.4 | 0.336 | 0.317 |
| 18 | 9.51 | 3.09 | 10.68 | 3.47 | 24.4 | 0.347 | 0.329 |
| 36 | 8.09 | 5.88 | 9.09 | 6.60 | 24.4 | 0.355 | 0.341 |
| 54 | 5.88 | 8.09 | 6.60 | 9.09 | 24.5 | 0.359 | 0.355 |
| 72 | 3.09 | 9.51 | 3.47 | 10.68 | 24.6 | 0.357 | 0.365 |
| 90 | 0.00 | 10.00 | 0.00 | 11.23 | 24.8 | 0.349 | 0.372 |
| 108 | –3.09 | 9.51 | –3.47 | 10.68 | 25.0 | 0.337 | 0.373 |
| 126 | –5.88 | 8.09 | –6.60 | 9.09 | 25.1 | 0.324 | 0.368 |
| 144 | –8.09 | 5.88 | –9.09 | 6.60 | 25.3 | 0.313 | 0.360 |
| 162 | –9.51 | 3.09 | –10.68 | 3.47 | 25.3 | 0.303 | 0.350 |
| 180 | –10.00 | 0.00 | –11.23 | 0.00 | 25.4 | 0.297 | 0.340 |
| 198 | –9.51 | –3.09 | –10.68 | –3.47 | 25.3 | 0.292 | 0.330 |
| 216 | –8.09 | –5.88 | –9.09 | –6.60 | 25.3 | 0.290 | 0.321 |
| 234 | –5.88 | –8.09 | –6.60 | –9.09 | 25.2 | 0.290 | 0.313 |
| 252 | –3.09 | –9.51 | –3.47 | –10.68 | 25.1 | 0.292 | 0.307 |
| 270 | 0.00 | –10.00 | 0.00 | –11.23 | 25.0 | 0.295 | 0.303 |
| 288 | 3.09 | –9.51 | 3.47 | –10.68 | 24.9 | 0.300 | 0.301 |
| 306 | 5.88 | –8.09 | 6.60 | –9.09 | 24.8 | 0.307 | 0.301 |
| 324 | 8.09 | –5.88 | 9.09 | –6.60 | 24.6 | 0.316 | 0.303 |
| 342 | 9.51 | –3.09 | 10.68 | –3.47 | 24.5 | 0.326 | 0.309 |
| $M' = 20;\ M = 25.34$ | | | | | | | |
| 0 | 20.00 | 0.00 | 25.34 | 0.00 | 23.7 | 0.366 | 0.301 |
| 18 | 19.02 | 6.18 | 24.10 | 7.83 | 23.6 | 0.392 | 0.326 |
| 36 | 16.18 | 11.76 | 20.50 | 14.89 | 23.7 | 0.412 | 0.354 |
| 54 | 11.76 | 16.18 | 14.89 | 20.50 | 23.9 | 0.425 | 0.383 |
| 72 | 6.18 | 19.02 | 7.83 | 24.10 | 24.2 | 0.420 | 0.408 |
| 90 | 0.00 | 20.00 | 0.00 | 25.34 | 24.6 | 0.399 | 0.427 |
| 108 | –6.18 | 19.02 | –7.83 | 24.10 | 25.1 | 0.369 | 0.434 |
| 126 | –11.76 | 16.18 | –14.89 | 20.50 | 25.5 | 0.337 | 0.428 |
| 144 | –16.18 | 11.76 | –20.50 | 14.89 | 25.7 | 0.307 | 0.407 |
| 162 | –19.02 | 6.18 | –24.10 | 7.83 | 25.9 | 0.285 | 0.383 |
| 180 | –20.00 | 0.00 | –25.34 | 0.00 | 26.0 | 0.268 | 0.356 |
| 198 | –19.02 | –6.18 | –24.10 | –7.83 | 26.0 | 0.259 | 0.330 |
| 216 | –16.18 | –11.76 | –20.50 | –14.89 | 25.9 | 0.255 | 0.306 |
| 234 | –11.76 | –16.18 | –14.89 | –20.50 | 25.7 | 0.257 | 0.288 |
| 252 | –6.18 | –19.02 | –7.83 | –24.10 | 25.5 | 0.261 | 0.275 |
| 270 | 0.00 | –20.00 | 0.00 | –25.34 | 25.2 | 0.269 | 0.265 |
| 288 | 6.18 | –19.02 | 7.83 | –24.10 | 24.8 | 0.281 | 0.261 |
| 306 | 11.76 | –16.18 | 14.89 | –20.50 | 24.5 | 0.296 | 0.262 |
| 324 | 16.18 | –11.76 | 20.50 | –14.89 | 24.2 | 0.315 | 0.267 |
| 342 | 19.02 | –6.18 | 24.10 | –7.83 | 23.9 | 0.339 | 0.281 |
| $M' = 30;\ M = 43.06$ | | | | | | | |
| 0 | 30.00 | 0.00 | 43.06 | 0.00 | 22.8 | 0.403 | 0.281 |
| 18 | 28.53 | 9.27 | 40.95 | 13.31 | 22.7 | 0.450 | 0.321 |
| 36 | 24.27 | 17.63 | 34.84 | 25.31 | 22.9 | 0.483 | 0.361 |
| 54 | 17.63 | 24.27 | 25.31 | 34.84 | 23.1 | 0.508 | 0.402 |
| 72 | 9.27 | 28.53 | 13.31 | 40.95 | 23.7 | 0.495 | 0.440 |
| 90 | 0.00 | 30.00 | 0.00 | 43.06 | 24.4 | 0.460 | 0.475 |
| 108 | –9.27 | 28.53 | –13.31 | 40.95 | 25.2 | 0.408 | 0.502 |
| 126 | –17.63 | 24.27 | –25.31 | 34.84 | 25.9 | 0.349 | 0.507 |
| 144 | –24.27 | 17.63 | –34.84 | 25.31 | 26.4 | 0.296 | 0.474 |
| 162 | –28.53 | 9.27 | –40.95 | 13.31 | 26.8 | 0.254 | 0.432 |
| 180 | –30.00 | 0.00 | –43.06 | 0.00 | 27.0 | 0.228 | 0.379 |
| 198 | –28.53 | –9.27 | –40.95 | –13.31 | 27.0 | 0.214 | 0.328 |
| 216 | –24.27 | –17.63 | –34.84 | –25.31 | 26.8 | 0.210 | 0.284 |
| 234 | –17.63 | –24.27 | –25.31 | –34.84 | 26.4 | 0.218 | 0.254 |
| 252 | –9.27 | –28.53 | –13.31 | –40.95 | 25.9 | 0.227 | 0.232 |
| 270 | 0.00 | –30.00 | 0.00 | –43.06 | 25.4 | 0.240 | 0.218 |
| 288 | 9.27 | –28.53 | 13.31 | –40.95 | 24.8 | 0.257 | 0.213 |
| 306 | 17.63 | –24.27 | 25.31 | –34.84 | 24.2 | 0.281 | 0.216 |

Table 6 (end)

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| 324 | 24.27 | –17.63 | 34.84 | –25.31 | 23.6 | 0.312 | 0.223 |
| 342 | 28.53 | –9.27 | 40.95 | –13.31 | 23.1 | 0.354 | 0.247 |
| $M' = 40$; $M = 65.32$ | | | | | | | |
| 0 | 40.00 | 0.00 | 65.32 | 0.00 | 21.8 | 0.446 | 0.257 |
| 18 | 38.04 | 12.36 | 62.12 | 20.18 | 21.8 | 0.518 | 0.311 |
| 36 | 32.36 | 23.51 | 52.84 | 38.39 | 22.1 | 0.560 | 0.359 |
| 54 | 23.51 | 32.36 | 38.39 | 52.84 | 22.4 | 0.588 | 0.394 |
| 72 | 12.36 | 38.04 | 20.18 | 62.12 | 23.2 | 0.560 | 0.435 |
| 90 | 0.00 | 40.00 | 0.00 | 65.32 | 24.2 | 0.509 | 0.487 |
| 108 | –12.36 | 38.04 | –20.18 | 62.12 | 25.3 | 0.438 | 0.548 |
| 126 | –23.51 | 32.36 | –38.39 | 52.84 | 26.4 | 0.352 | 0.595 |
| 144 | –32.36 | 23.51 | –52.84 | 38.39 | 27.2 | 0.271 | 0.565 |
| 162 | –38.04 | 12.36 | –62.12 | 20.18 | 27.9 | 0.205 | 0.506 |
| 180 | –40.00 | 0.00 | –65.32 | 0.00 | 28.3 | 0.168 | 0.415 |
| 198 | –38.04 | –12.36 | –62.12 | –20.18 | 28.5 | 0.156 | 0.323 |
| 216 | –32.36 | –23.51 | –52.84 | –38.39 | 28.3 | 0.159 | 0.251 |
| 234 | –23.51 | –32.36 | –38.39 | –52.84 | 27.5 | 0.178 | 0.211 |
| 252 | –12.36 | –38.04 | –20.18 | –62.12 | 26.7 | 0.192 | 0.182 |
| *270* | *0.00* | *–40.00* | *0.00* | *–65.32* | *25.7* | *0.210* | *0.166* |
| *288* | *12.36* | *–38.04* | *20.18* | *–62.12* | *24.7* | *0.232* | *0.160* |
| 306 | 23.51 | –32.36 | 38.39 | –52.84 | 23.8 | 0.263 | 0.165 |
| 324 | 32.36 | –23.51 | 52.84 | –38.39 | 22.7 | 0.304 | 0.173 |
| 342 | 38.04 | –12.36 | 62.12 | –20.18 | 22.1 | 0.369 | 0.209 |
| $M' = 50$; $M = 93.28$ | | | | | | | |
| 0 | 50.00 | 0.00 | 93.28 | 0.00 | 20.6 | 0.495 | 0.232 |
| 18 | 47.55 | 15.45 | 88.71 | 28.82 | 20.8 | 0.592 | 0.296 |
| 36 | 40.45 | 29.39 | 75.46 | 54.83 | 21.3 | 0.630 | 0.343 |
| *54* | *29.39* | *40.45* | *54.83* | *75.46* | *21.6* | *0.642* | *0.357* |

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| *72* | *15.45* | *47.55* | *28.82* | *88.71* | *22.7* | *0.606* | *0.402* |
| *108* | *–15.45* | *47.55* | *–28.82* | *88.71* | *25.6* | *0.451* | *0.552* |
| *126* | *–29.39* | *40.45* | *–54.83* | *75.46* | *27.1* | *0.336* | *0.661* |
| 144 | –40.45 | 29.39 | –75.46 | 54.83 | 28.1 | 0.227 | 0.683 |
| *162* | *–47.55* | *15.45* | *–88.71* | *28.82* | *29.4* | *0.122* | *0.624* |
| *180* | *–50.00* | *0.00* | *–93.28* | *0.00* | *30.3* | *0.077* | *0.468* |
| *198* | *–47.55* | *–15.45* | *–88.71* | *–28.82* | *30.8* | *0.085* | *0.313* |
| *216* | *–40.45* | *–29.39* | *–75.46* | *–54.83* | *30.8* | *0.110* | *0.206* |
| *234* | *–29.39* | *–40.45* | *–54.83* | *–75.46* | *29.2* | *0.144* | *0.162* |
| *252* | *–15.45* | *–47.55* | *–28.82* | *–88.71* | *27.9* | *0.164* | *0.130* |
| *270* | *0.00* | *–50.00* | *0.00* | *–93.28* | *26.3* | *0.185* | *0.113* |
| *288* | *15.45* | *–47.55* | *28.82* | *–88.71* | *24.7* | *0.209* | *0.109* |
| *306* | *29.39* | *–40.45* | *54.83* | *–75.46* | *23.2* | *0.242* | *0.115* |
| 324 | 40.45 | –29.39 | 75.46 | –54.83 | 21.6 | 0.290 | 0.121 |
| 342 | 47.55 | –15.45 | 88.71 | –28.82 | 20.8 | 0.379 | 0.167 |
| $M' = 60$; $M = 128.4$ | | | | | | | |
| *0* | *60.00* | *0.00* | *128.40* | *0.00* | *19.4* | *0.548* | *0.206* |
| 18 | 57.06 | 18.54 | 122.11 | 39.68 | 19.8 | 0.665 | 0.276 |
| 36 | 48.54 | 35.27 | 103.88 | 75.47 | 20.5 | 0.682 | 0.315 |
| *252* | *–18.54* | *–57.06* | *–39.68* | *–122.11* | *29.9* | *0.148* | *0.083* |
| *270* | *0.00* | *–60.00* | *0.00* | *–128.40* | *27.4* | *0.168* | *0.069* |
| *288* | *18.54* | *–57.06* | *39.68* | *–122.11* | *24.8* | *0.190* | *0.066* |
| *306* | *35.27* | *–48.54* | *75.47* | *–103.88* | *22.5* | *0.222* | *0.072* |
| *324* | *48.54* | *–35.27* | *103.88* | *–75.47* | *20.2* | *0.268* | *0.073* |
| *342* | *57.06* | *–18.54* | *122.11* | *–39.68* | *19.4* | *0.383* | *0.126* |
| $M' = 70$; $M = 171.51$ | | | | | | | |
| *306* | *41.14* | *–56.63* | *101.40* | *–139.56* | *21.8* | *0.203* | *0.040* |
| *324* | *56.63* | *–41.14* | *139.56* | *–101.40* | *18.6* | *0.239* | *0.036* |

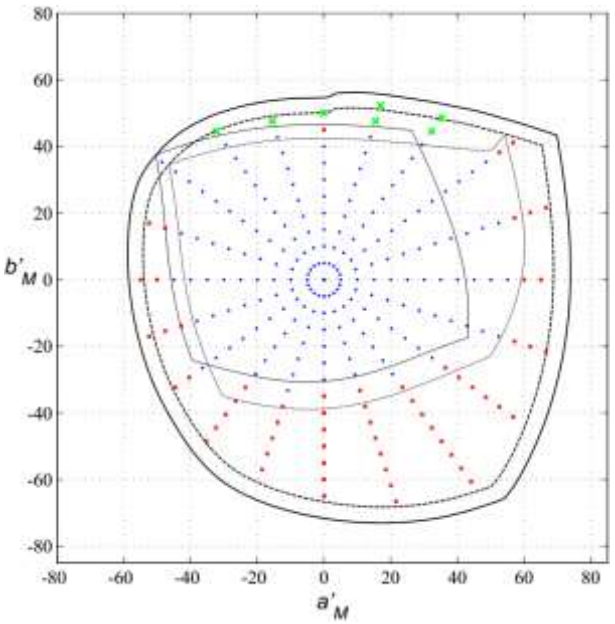


Figure 19 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 70$ on $a'_M, b'_M$ plane of the CAM02–UCS space

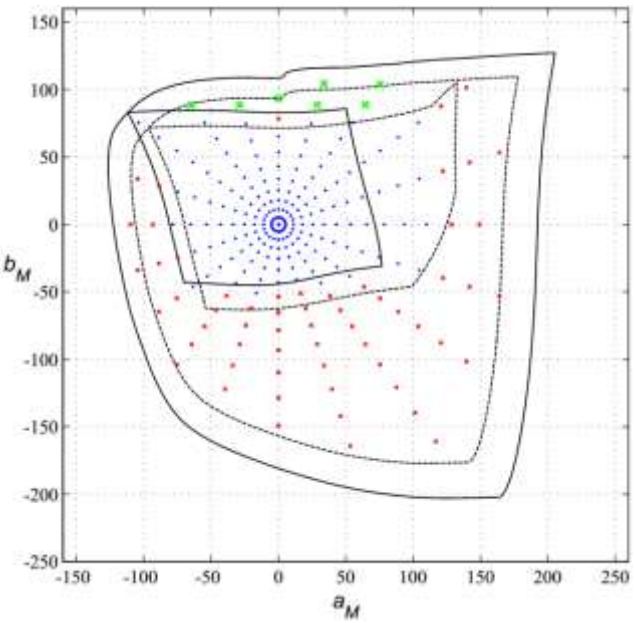


Figure 20 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 70$ on $a_M, b_M$ plane of the CIECAM02 space

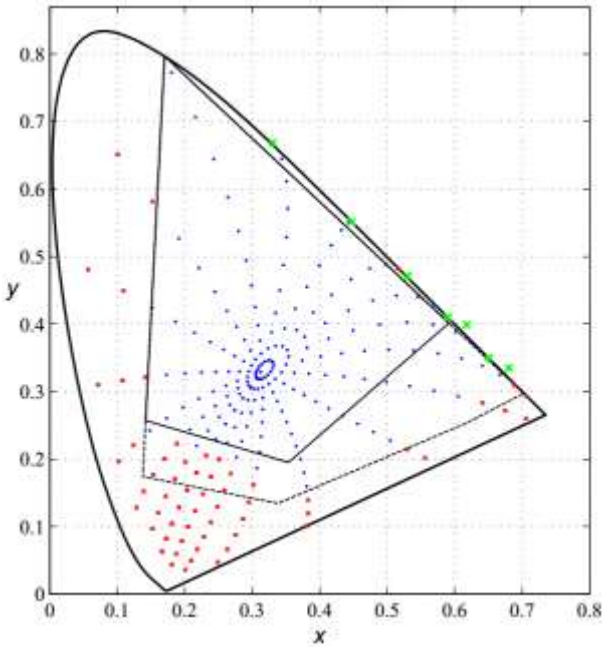


Figure 21 – Color points of existing colour gamut and of color gamut transmitted and reproduced by UHDTV system for $J' = 70$ on the $x, y$ plane of the CIE-31 space

Table 7 – Values of CAM02-UCS, CIECAM02 and $Y, x, y$ color grid nodes coordinates calculated for $J' = 70$ and corresponding $J = 57.87$

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| $M' = 10$; $M = 11.23$ | | | | | | | |
| 0 | 10.00 | 0.00 | 11.23 | 0.00 | 35.9 | 0.334 | 0.319 |
| 18 | 9.51 | 3.09 | 10.68 | 3.47 | 35.8 | 0.343 | 0.329 |
| 36 | 8.09 | 5.88 | 9.09 | 6.60 | 35.9 | 0.350 | 0.340 |
| 54 | 5.88 | 8.09 | 6.60 | 9.09 | 36.0 | 0.354 | 0.352 |
| 72 | 3.09 | 9.51 | 3.47 | 10.68 | 36.2 | 0.352 | 0.362 |
| 90 | 0.00 | 10.00 | 0.00 | 11.23 | 36.4 | 0.345 | 0.367 |
| 108 | –3.09 | 9.51 | –3.47 | 10.68 | 36.7 | 0.334 | 0.368 |
| 126 | –5.88 | 8.09 | –6.60 | 9.09 | 36.9 | 0.323 | 0.364 |
| 144 | –8.09 | 5.88 | –9.09 | 6.60 | 37.0 | 0.313 | 0.357 |
| 162 | –9.51 | 3.09 | –10.68 | 3.47 | 37.1 | 0.305 | 0.348 |
| 180 | –10.00 | 0.00 | –11.23 | 0.00 | 37.1 | 0.299 | 0.339 |
| 198 | –9.51 | –3.09 | –10.68 | –3.47 | 37.1 | 0.295 | 0.330 |
| 216 | –8.09 | –5.88 | –9.09 | –6.60 | 37.1 | 0.293 | 0.322 |
| 234 | –5.88 | –8.09 | –6.60 | –9.09 | 37.0 | 0.293 | 0.315 |
| 252 | –3.09 | –9.51 | –3.47 | –10.68 | 36.9 | 0.294 | 0.310 |
| 270 | 0.00 | –10.00 | 0.00 | –11.23 | 36.7 | 0.297 | 0.306 |
| 288 | 3.09 | –9.51 | 3.47 | –10.68 | 36.5 | 0.302 | 0.304 |
| 306 | 5.88 | –8.09 | 6.60 | –9.09 | 36.4 | 0.308 | 0.304 |
| 324 | 8.09 | –5.88 | 9.09 | –6.60 | 36.2 | 0.316 | 0.306 |
| 342 | 9.51 | –3.09 | 10.68 | –3.47 | 36.0 | 0.324 | 0.311 |
| $M' = 20$; $M = 25.34$ | | | | | | | |
| 0 | 20.00 | 0.00 | 25.34 | 0.00 | 35.0 | 0.361 | 0.304 |
| 18 | 19.02 | 6.18 | 24.10 | 7.83 | 34.9 | 0.384 | 0.326 |
| 36 | 16.18 | 11.76 | 20.50 | 14.89 | 34.9 | 0.401 | 0.352 |
| 54 | 11.76 | 16.18 | 14.89 | 20.50 | 35.2 | 0.413 | 0.379 |
| 72 | 6.18 | 19.02 | 7.83 | 24.10 | 35.6 | 0.408 | 0.402 |
| 90 | 0.00 | 20.00 | 0.00 | 25.34 | 36.2 | 0.390 | 0.417 |
| 108 | –6.18 | 19.02 | –7.83 | 24.10 | 36.8 | 0.364 | 0.423 |
| 126 | –11.76 | 16.18 | –14.89 | 20.50 | 37.3 | 0.335 | 0.417 |
| 144 | –16.18 | 11.76 | –20.50 | 14.89 | 37.6 | 0.309 | 0.398 |
| 162 | –19.02 | 6.18 | –24.10 | 7.83 | 37.9 | 0.288 | 0.377 |
| 180 | –20.00 | 0.00 | –25.34 | 0.00 | 38.0 | 0.274 | 0.353 |
| 198 | –19.02 | –6.18 | –24.10 | –7.83 | 38.0 | 0.265 | 0.330 |
| 216 | –16.18 | –11.76 | –20.50 | –14.89 | 37.9 | 0.261 | 0.309 |
| 234 | –11.76 | –16.18 | –14.89 | –20.50 | 37.6 | 0.263 | 0.293 |
| 252 | –6.18 | –19.02 | –7.83 | –24.10 | 37.3 | 0.267 | 0.281 |
| 270 | 0.00 | –20.00 | 0.00 | –25.34 | 36.9 | 0.274 | 0.272 |
| 288 | 6.18 | –19.02 | 7.83 | –24.10 | 36.5 | 0.284 | 0.268 |
| 306 | 11.76 | –16.18 | 14.89 | –20.50 | 36.0 | 0.298 | 0.269 |
| 324 | 16.18 | –11.76 | 20.50 | –14.89 | 35.6 | 0.315 | 0.274 |
| 342 | 19.02 | –6.18 | 24.10 | –7.83 | 35.2 | 0.337 | 0.286 |
| $M' = 30$; $M = 43.06$ | | | | | | | |
| 0 | 30.00 | 0.00 | 43.06 | 0.00 | 33.8 | 0.394 | 0.285 |
| 18 | 28.53 | 9.27 | 40.95 | 13.31 | 33.7 | 0.436 | 0.322 |
| 36 | 24.27 | 17.63 | 34.84 | 25.31 | 33.9 | 0.466 | 0.360 |
| 54 | 17.63 | 24.27 | 25.31 | 34.84 | 34.2 | 0.489 | 0.399 |
| 72 | 9.27 | 28.53 | 13.31 | 40.95 | 35.0 | 0.478 | 0.435 |
| 90 | 0.00 | 30.00 | 0.00 | 43.06 | 35.9 | 0.446 | 0.466 |
| 108 | –9.27 | 28.53 | –13.31 | 40.95 | 36.9 | 0.399 | 0.487 |
| 126 | –17.63 | 24.27 | –25.31 | 34.84 | 37.8 | 0.346 | 0.488 |
| 144 | –24.27 | 17.63 | –34.84 | 25.31 | 38.5 | 0.299 | 0.457 |
| 162 | –28.53 | 9.27 | –40.95 | 13.31 | 39.0 | 0.262 | 0.419 |
| 180 | –30.00 | 0.00 | –43.06 | 0.00 | 39.2 | 0.238 | 0.373 |
| 198 | –28.53 | –9.27 | –40.95 | –13.31 | 39.3 | 0.225 | 0.328 |
| 216 | –24.27 | –17.63 | –34.84 | –25.31 | 39.0 | 0.221 | 0.289 |
| 234 | –17.63 | –24.27 | –25.31 | –34.84 | 38.5 | 0.227 | 0.262 |
| 252 | –9.27 | –28.53 | –13.31 | –40.95 | 37.9 | 0.234 | 0.242 |
| 270 | 0.00 | –30.00 | 0.00 | –43.06 | 37.2 | 0.246 | 0.229 |
| 288 | 9.27 | –28.53 | 13.31 | –40.95 | 36.4 | 0.263 | 0.224 |
| 306 | 17.63 | –24.27 | 25.31 | –34.84 | 35.6 | 0.285 | 0.226 |

Table 7 (end)

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| 324 | 24.27 | –17.63 | 34.84 | –25.31 | 34.8 | 0.313 | 0.233 |
| 342 | 28.53 | –9.27 | 40.95 | –13.31 | 34.2 | 0.351 | 0.255 |
| $M' = 40$; $M = 65.32$ | | | | | | | |
| 0 | 40.00 | 0.00 | 65.32 | 0.00 | 32.4 | 0.434 | 0.264 |
| 18 | 38.04 | 12.36 | 62.12 | 20.18 | 32.3 | 0.499 | 0.314 |
| 36 | 32.36 | 23.51 | 52.84 | 38.39 | 32.7 | 0.539 | 0.361 |
| 54 | 23.51 | 32.36 | 38.39 | 52.84 | 33.2 | 0.568 | 0.399 |
| 72 | 12.36 | 38.04 | 20.18 | 62.12 | 34.3 | 0.545 | 0.440 |
| 90 | 0.00 | 40.00 | 0.00 | 65.32 | 35.6 | 0.498 | 0.488 |
| 108 | –12.36 | 38.04 | –20.18 | 62.12 | 37.1 | 0.432 | 0.539 |
| 126 | –23.51 | 32.36 | –38.39 | 52.84 | 38.6 | 0.353 | 0.571 |
| 144 | –32.36 | 23.51 | –52.84 | 38.39 | 39.5 | 0.280 | 0.538 |
| 162 | –38.04 | 12.36 | –62.12 | 20.18 | 40.4 | 0.221 | 0.483 |
| 180 | –40.00 | 0.00 | –65.32 | 0.00 | 41.0 | 0.186 | 0.404 |
| 198 | –38.04 | –12.36 | –62.12 | –20.18 | 41.1 | 0.173 | 0.325 |
| 216 | –32.36 | –23.51 | –52.84 | –38.39 | 40.9 | 0.173 | 0.261 |
| *234* | *–23.51* | *–32.36* | *–38.39* | *–52.84* | *39.8* | *0.188* | *0.223* |
| *252* | *–12.36* | *–38.04* | *–20.18* | *–62.12* | *38.8* | *0.201* | *0.196* |
| *270* | *0.00* | *–40.00* | *0.00* | *–65.32* | *37.6* | *0.217* | *0.180* |
| *288* | *12.36* | *–38.04* | *20.18* | *–62.12* | *36.3* | *0.239* | *0.174* |
| *306* | *23.51* | *–32.36* | *38.39* | *–52.84* | *35.0* | *0.268* | *0.179* |
| 324 | 32.36 | –23.51 | 52.84 | –38.39 | 33.7 | 0.307 | 0.187 |
| 342 | 38.04 | –12.36 | 62.12 | –20.18 | 32.8 | 0.365 | 0.219 |
| $M' = 50$; $M = 93.28$ | | | | | | | |
| 0 | 50.00 | 0.00 | 93.28 | 0.00 | 30.8 | 0.480 | 0.240 |
| 18 | 47.55 | 15.45 | 88.71 | 28.82 | 30.9 | 0.569 | 0.301 |
| 36 | 40.45 | 29.39 | 75.46 | 54.83 | 31.6 | 0.610 | 0.349 |
| 54 | 29.39 | 40.45 | 54.83 | 75.46 | 32.1 | 0.628 | 0.370 |
| *72* | *15.45* | *47.55* | *28.82* | *88.71* | *33.5* | *0.590* | *0.410* |
| *90* | *0.00* | *50.00* | *0.00* | *93.28* | *35.3* | *0.530* | *0.471* |
| *108* | *–15.45* | *47.55* | *–28.82* | *88.71* | *37.4* | *0.447* | *0.552* |
| 126 | –29.39 | 40.45 | –54.83 | 75.46 | 39.5 | 0.344 | 0.645 |
| 144 | –40.45 | 29.39 | –75.46 | 54.83 | 40.8 | 0.243 | 0.644 |
| *162* | *–47.55* | *15.45* | *–88.71* | *28.82* | *42.4* | *0.152* | *0.582* |
| *180* | *–50.00* | *0.00* | *–93.28* | *0.00* | *43.5* | *0.109* | *0.449* |
| *198* | *–47.55* | *–15.45* | *–88.71* | *–28.82* | *44.0* | *0.108* | *0.317* |
| *216* | *–40.45* | *–29.39* | *–75.46* | *–54.83* | *43.9* | *0.124* | *0.221* |
| *234* | *–29.39* | *–40.45* | *–54.83* | *–75.46* | *41.9* | *0.153* | *0.177* |
| *252* | *–15.45* | *–47.55* | *–28.82* | *–88.71* | *40.3* | *0.172* | *0.145* |
| *270* | *0.00* | *–50.00* | *0.00* | *–93.28* | *38.3* | *0.192* | *0.129* |
| *288* | *15.45* | *–47.55* | *28.82* | *–88.71* | *36.3* | *0.215* | *0.124* |
| *306* | *29.39* | *–40.45* | *54.83* | *–75.46* | *34.3* | *0.249* | *0.130* |
| *324* | *40.45* | *–29.39* | *75.46* | *–54.83* | *32.2* | *0.295* | *0.136* |
| 342 | 47.55 | –15.45 | 88.71 | –28.82 | 31.2 | 0.377 | 0.180 |
| $M' = 60$; $M = 128.4$ | | | | | | | |
| *0* | *60.00* | *0.00* | *128.40* | *0.00* | *29.0* | *0.530* | *0.215* |
| *18* | *57.06* | *18.54* | *122.11* | *39.68* | *29.5* | *0.641* | *0.283* |
| 36 | 48.54 | 35.27 | 103.88 | 75.47 | 30.5 | 0.667 | 0.325 |
| *54* | *35.27* | *48.54* | *75.47* | *103.88* | *31.1* | *0.680* | *0.335* |
| 144 | –48.54 | 35.27 | –103.88 | 75.47 | 42.4 | 0.180 | 0.773 |
| *234* | *–35.27* | *–48.54* | *–75.47* | *–103.88* | *45.3* | *0.128* | *0.128* |
| *252* | *–18.54* | *–57.06* | *–39.68* | *–122.11* | *42.7* | *0.152* | *0.097* |
| *270* | *0.00* | *–60.00* | *0.00* | *–128.40* | *39.6* | *0.172* | *0.082* |
| *288* | *18.54* | *–57.06* | *39.68* | *–122.11* | *36.3* | *0.195* | *0.079* |
| *306* | *35.27* | *–48.54* | *75.47* | *–103.88* | *33.4* | *0.228* | *0.085* |
| *324* | *48.54* | *–35.27* | *103.88* | *–75.47* | *30.3* | *0.276* | *0.088* |
| *342* | *57.06* | *–18.54* | *122.11* | *–39.68* | *29.2* | *0.383* | *0.139* |
| $M' = 70$; $M = 172.51$ | | | | | | | |
| *18* | *66.57* | *21.63* | *164.07* | *53.31* | *28.3* | *0.706* | *0.260* |
| *36* | *56.63* | *41.14* | *139.56* | *101.40* | *29.5* | *0.705* | *0.294* |
| *288* | *21.63* | *–66.57* | *53.31* | *–164.07* | *36.8* | *0.181* | *0.044* |
| *306* | *41.14* | *–56.63* | *101.40* | *–139.56* | *32.4* | *0.209* | *0.050* |
| *324* | *56.63* | *–41.14* | *139.56* | *–101.40* | *28.1* | *0.249* | *0.048* |
| *342* | *66.57* | *–21.63* | *164.07* | *–53.31* | *27.1* | *0.380* | *0.101* |

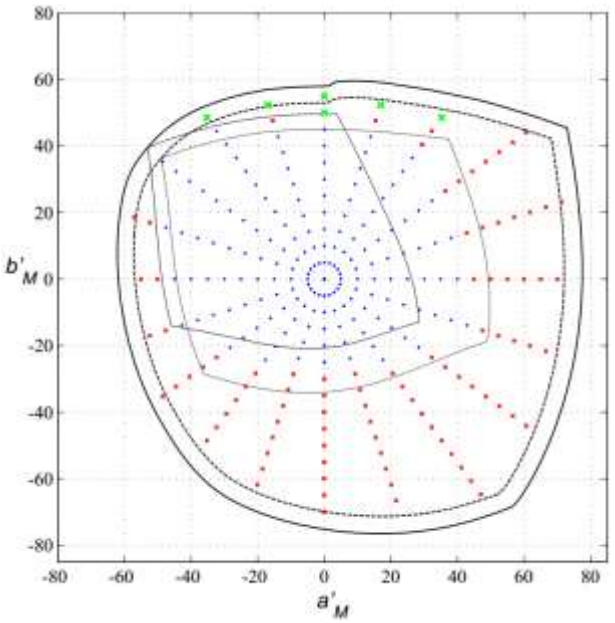


Figure 22 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 80$ on $a'_M, b'_M$ plane of the CAM02–UCS space

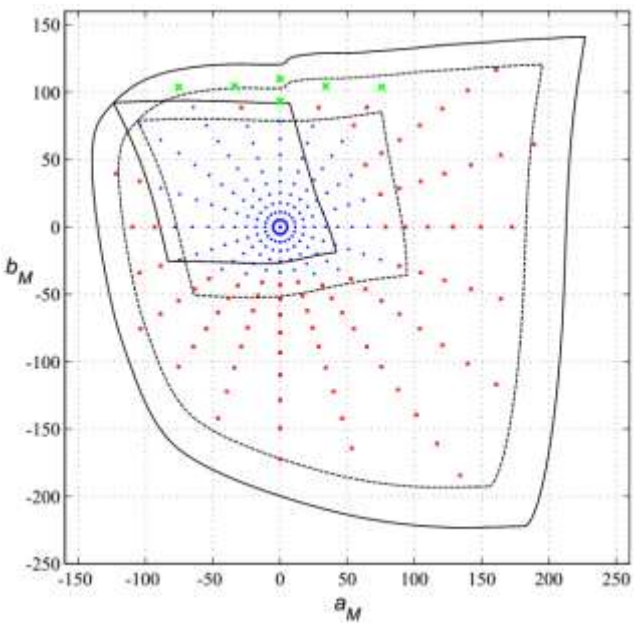


Figure 23 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 80$ on $a_M, b_M$ plane of the CIECAM02 space

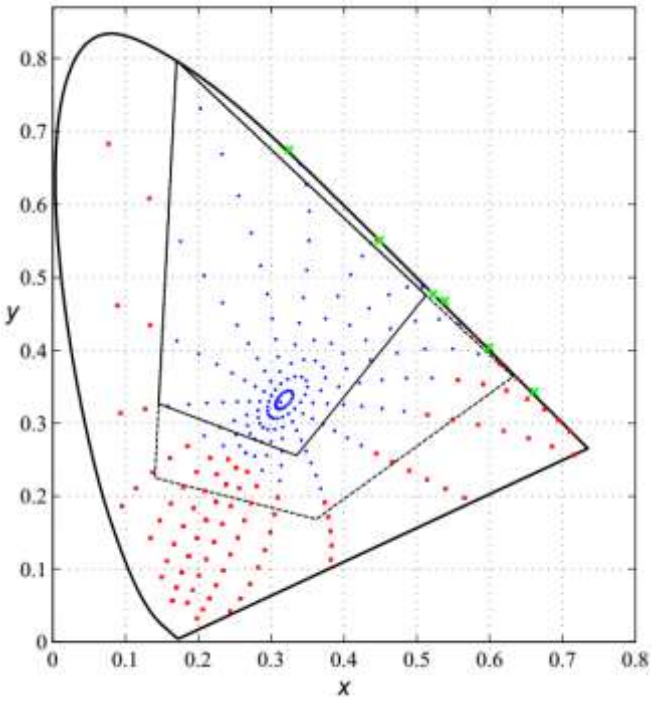


Figure 24 – Color points of existing colour gamut and of color gamut transmitted and reproduced by UHDTV system for $J' = 80$ on the $x, y$ plane of the CIE-31 space

Table 8 – Values of CAM02-UCS, CIECAM02 and $Y, x, y$ color grid nodes coordinates calculated for $J' = 80$ and corresponding $J = 70.18$

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| $M' = 10;\ M = 11.23$ | | | | | | | |
| 0 | 10.00 | 0.00 | 11.23 | 0.00 | 51.2 | 0.332 | 0.320 |
| 18 | 9.51 | 3.09 | 10.68 | 3.47 | 51.1 | 0.340 | 0.329 |
| 36 | 8.09 | 5.88 | 9.09 | 6.60 | 51.2 | 0.347 | 0.339 |
| 54 | 5.88 | 8.09 | 6.60 | 9.09 | 51.3 | 0.350 | 0.350 |
| 72 | 3.09 | 9.51 | 3.47 | 10.68 | 51.5 | 0.348 | 0.358 |
| 90 | 0.00 | 10.00 | 0.00 | 11.23 | 51.9 | 0.342 | 0.363 |
| 108 | –3.09 | 9.51 | –3.47 | 10.68 | 52.2 | 0.332 | 0.364 |
| 126 | –5.88 | 8.09 | –6.60 | 9.09 | 52.4 | 0.322 | 0.360 |
| 144 | –8.09 | 5.88 | –9.09 | 6.60 | 52.6 | 0.313 | 0.354 |
| 162 | –9.51 | 3.09 | –10.68 | 3.47 | 52.8 | 0.306 | 0.346 |
| 180 | –10.00 | 0.00 | –11.23 | 0.00 | 52.8 | 0.300 | 0.338 |
| 198 | –9.51 | –3.09 | –10.68 | –3.47 | 52.8 | 0.297 | 0.330 |
| 216 | –8.09 | –5.88 | –9.09 | –6.60 | 52.7 | 0.295 | 0.323 |
| 234 | –5.88 | –8.09 | –6.60 | –9.09 | 52.6 | 0.295 | 0.317 |
| 252 | –3.09 | –9.51 | –3.47 | –10.68 | 52.4 | 0.296 | 0.312 |
| 270 | 0.00 | –10.00 | 0.00 | –11.23 | 52.2 | 0.299 | 0.308 |
| 288 | 3.09 | –9.51 | 3.47 | –10.68 | 52.0 | 0.303 | 0.307 |
| 306 | 5.88 | –8.09 | 6.60 | –9.09 | 51.8 | 0.309 | 0.307 |
| 324 | 8.09 | –5.88 | 9.09 | –6.60 | 51.6 | 0.316 | 0.308 |
| 342 | 9.51 | –3.09 | 10.68 | –3.47 | 51.4 | 0.324 | 0.313 |
| $M' = 20;\ M = 25.34$ | | | | | | | |
| 0 | 20.00 | 0.00 | 25.34 | 0.00 | 50.0 | 0.356 | 0.306 |
| 18 | 19.02 | 6.18 | 24.10 | 7.83 | 49.9 | 0.377 | 0.327 |
| 36 | 16.18 | 11.76 | 20.50 | 14.89 | 50.0 | 0.393 | 0.350 |
| 54 | 11.76 | 16.18 | 14.89 | 20.50 | 50.2 | 0.403 | 0.375 |
| 72 | 6.18 | 19.02 | 7.83 | 24.10 | 50.8 | 0.399 | 0.395 |
| 90 | 0.00 | 20.00 | 0.00 | 25.34 | 51.6 | 0.382 | 0.410 |
| 108 | –6.18 | 19.02 | –7.83 | 24.10 | 52.3 | 0.359 | 0.414 |
| 126 | –11.76 | 16.18 | –14.89 | 20.50 | 53.0 | 0.333 | 0.408 |
| 144 | –16.18 | 11.76 | –20.50 | 14.89 | 53.4 | 0.309 | 0.391 |
| 162 | –19.02 | 6.18 | –24.10 | 7.83 | 53.8 | 0.291 | 0.372 |
| 180 | –20.00 | 0.00 | –25.34 | 0.00 | 53.9 | 0.278 | 0.350 |
| 198 | –19.02 | –6.18 | –24.10 | –7.83 | 53.9 | 0.270 | 0.330 |
| 216 | –16.18 | –11.76 | –20.50 | –14.89 | 53.7 | 0.266 | 0.311 |
| 234 | –11.76 | –16.18 | –14.89 | –20.50 | 53.4 | 0.268 | 0.297 |
| 252 | –6.18 | –19.02 | –7.83 | –24.10 | 53.0 | 0.271 | 0.285 |
| 270 | 0.00 | –20.00 | 0.00 | –25.34 | 52.5 | 0.278 | 0.278 |
| 288 | 6.18 | –19.02 | 7.83 | –24.10 | 51.9 | 0.287 | 0.274 |
| 306 | 11.76 | –16.18 | 14.89 | –20.50 | 51.4 | 0.300 | 0.275 |
| 324 | 16.18 | –11.76 | 20.50 | –14.89 | 50.8 | 0.316 | 0.279 |
| 342 | 19.02 | –6.18 | 24.10 | –7.83 | 50.3 | 0.335 | 0.290 |
| $M' = 30;\ M = 43.06$ | | | | | | | |
| 0 | 30.00 | 0.00 | 43.06 | 0.00 | 48.5 | 0.387 | 0.289 |
| 18 | 28.53 | 9.27 | 40.95 | 13.31 | 48.3 | 0.424 | 0.323 |
| 36 | 24.27 | 17.63 | 34.84 | 25.31 | 48.5 | 0.452 | 0.359 |
| 54 | 17.63 | 24.27 | 25.31 | 34.84 | 49.0 | 0.473 | 0.396 |
| 72 | 9.27 | 28.53 | 13.31 | 40.95 | 50.0 | 0.464 | 0.430 |
| 90 | 0.00 | 30.00 | 0.00 | 43.06 | 51.2 | 0.434 | 0.457 |
| 108 | –9.27 | 28.53 | –13.31 | 40.95 | 52.5 | 0.392 | 0.474 |
| 126 | –17.63 | 24.27 | –25.31 | 34.84 | 53.7 | 0.344 | 0.472 |
| 144 | –24.27 | 17.63 | –34.84 | 25.31 | 54.5 | 0.301 | 0.443 |
| 162 | –28.53 | 9.27 | –40.95 | 13.31 | 55.1 | 0.269 | 0.409 |
| 180 | –30.00 | 0.00 | –43.06 | 0.00 | 55.5 | 0.246 | 0.369 |
| 198 | –28.53 | –9.27 | –40.95 | –13.31 | 55.5 | 0.234 | 0.329 |
| 216 | –24.27 | –17.63 | –34.84 | –25.31 | 55.2 | 0.230 | 0.294 |

Table 8 (end)

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| 234 | –17.63 | –24.27 | –25.31 | –34.84 | 54.5 | 0.234 | 0.269 |
| *252* | *–9.27* | *–28.53* | *–13.31* | *–40.95* | *53.7* | *0.241* | *0.251* |
| *270* | *0.00* | *–30.00* | *0.00* | *–43.06* | *52.8* | *0.252* | *0.239* |
| *288* | *9.27* | *–28.53* | *13.31* | *–40.95* | *51.9* | *0.267* | *0.234* |
| 306 | 17.63 | –24.27 | 25.31 | –34.84 | 50.8 | 0.287 | 0.235 |
| 324 | 24.27 | –17.63 | 34.84 | –25.31 | 49.8 | 0.314 | 0.242 |
| 342 | 28.53 | –9.27 | 40.95 | –13.31 | 49.0 | 0.348 | 0.262 |
| $M' = 40; M = 65.32$ | | | | | | | |
| 0 | 40.00 | 0.00 | 65.32 | 0.00 | 46.6 | 0.424 | 0.270 |
| 18 | 38.04 | 12.36 | 62.12 | 20.18 | 46.5 | 0.482 | 0.316 |
| 36 | 32.36 | 23.51 | 52.84 | 38.39 | 47.0 | 0.521 | 0.362 |
| 54 | 23.51 | 32.36 | 38.39 | 52.84 | 47.6 | 0.549 | 0.402 |
| 72 | 12.36 | 38.04 | 20.18 | 62.12 | 49.0 | 0.530 | 0.442 |
| 90 | 0.00 | 40.00 | 0.00 | 65.32 | 50.8 | 0.487 | 0.487 |
| 108 | –12.36 | 38.04 | –20.18 | 62.12 | 52.8 | 0.425 | 0.529 |
| 126 | –23.51 | 32.36 | –38.39 | 52.84 | 54.6 | 0.352 | 0.550 |
| 144 | –32.36 | 23.51 | –52.84 | 38.39 | 55.9 | 0.285 | 0.516 |
| 162 | –38.04 | 12.36 | –62.12 | 20.18 | 57.0 | 0.233 | 0.465 |
| 180 | –40.00 | 0.00 | –65.32 | 0.00 | 57.7 | 0.201 | 0.395 |
| 198 | –38.04 | –12.36 | –62.12 | –20.18 | 57.8 | 0.187 | 0.326 |
| *216* | *–32.36* | *–23.51* | *–52.84* | *–38.39* | *57.4* | *0.185* | *0.269* |
| *234* | *–23.51* | *–32.36* | *–38.39* | *–52.84* | *56.2* | *0.198* | *0.233* |
| *252* | *–12.36* | *–38.04* | *–20.18* | *–62.12* | *54.9* | *0.209* | *0.207* |
| *270* | *0.00* | *–40.00* | *0.00* | *–65.32* | *53.4* | *0.224* | *0.192* |
| *288* | *12.36* | *–38.04* | *20.18* | *–62.12* | *51.7* | *0.245* | *0.187* |
| *306* | *23.51* | *–32.36* | *38.39* | *–52.84* | *50.1* | *0.272* | *0.190* |
| *324* | *32.36* | *–23.51* | *52.84* | *–38.39* | *48.4* | *0.309* | *0.198* |
| 342 | 38.04 | –12.36 | 62.12 | –20.18 | 47.2 | 0.362 | 0.228 |
| $M' = 50; M = 93.28$ | | | | | | | |
| *0* | *50.00* | *0.00* | *93.28* | *0.00* | *44.5* | *0.466* | *0.247* |
| *18* | *47.55* | *15.45* | *88.71* | *28.82* | *44.6* | *0.549* | *0.305* |
| *36* | *40.45* | *29.39* | *75.46* | *54.83* | *45.4* | *0.591* | *0.354* |
| *54* | *29.39* | *40.45* | *54.83* | *75.46* | *46.1* | *0.614* | *0.381* |
| *72* | *15.45* | *47.55* | *28.82* | *88.71* | *48.0* | *0.579* | *0.420* |
| *90* | *0.00* | *50.00* | *0.00* | *93.28* | *50.4* | *0.522* | *0.477* |
| *108* | *–15.45* | *47.55* | *–28.82* | *88.71* | *53.1* | *0.445* | *0.553* |
| 126 | –29.39 | 40.45 | –54.83 | 75.46 | 55.8 | 0.348 | 0.627 |
| 144 | –40.45 | 29.39 | –75.46 | 54.83 | 57.6 | 0.255 | 0.612 |

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| 162 | –47.55 | 15.45 | –88.71 | 28.82 | 59.5 | 0.175 | 0.549 |
| *180* | *–50.00* | *0.00* | *–93.28* | *0.00* | *60.8* | *0.134* | *0.435* |
| *198* | *–47.55* | *–15.45* | *–88.71* | *–28.82* | *61.3* | *0.127* | *0.320* |
| *216* | *–40.45* | *–29.39* | *–75.46* | *–54.83* | *61.0* | *0.137* | *0.233* |
| *234* | *–29.39* | *–40.45* | *–54.83* | *–75.46* | *58.7* | *0.162* | *0.190* |
| *252* | *–15.45* | *–47.55* | *–28.82* | *–88.71* | *56.7* | *0.179* | *0.159* |
| *270* | *0.00* | *–50.00* | *0.00* | *–93.28* | *54.2* | *0.198* | *0.142* |
| *288* | *15.45* | *–47.55* | *28.82* | *–88.71* | *51.7* | *0.222* | *0.137* |
| *306* | *29.39* | *–40.45* | *54.83* | *–75.46* | *49.2* | *0.254* | *0.143* |
| *324* | *40.45* | *–29.39* | *75.46* | *–54.83* | *46.5* | *0.299* | *0.150* |
| *342* | *47.55* | *–15.45* | *88.71* | *–28.82* | *45.1* | *0.374* | *0.191* |
| $M' = 60; M = 128.4$ | | | | | | | |
| *0* | *60.00* | *0.00* | *128.40* | *0.00* | *42.1* | *0.514* | *0.223* |
| *18* | *57.06* | *18.54* | *122.11* | *39.68* | *42.7* | *0.619* | *0.289* |
| *36* | *48.54* | *35.27* | *103.88* | *75.47* | *43.9* | *0.651* | *0.333* |
| *54* | *35.27* | *48.54* | *75.47* | *103.88* | *44.7* | *0.661* | *0.343* |
| *126* | *–35.27* | *48.54* | *–75.47* | *103.88* | *57.3* | *0.325* | *0.675* |
| 144 | –48.54 | 35.27 | –103.88 | 75.47 | 59.7 | 0.203 | 0.731 |
| *162* | *–57.06* | *18.54* | *–122.11* | *39.68* | *62.7* | *0.077* | *0.683* |
| *216* | *–48.54* | *–35.27* | *–103.88* | *–75.47* | *67.2* | *0.095* | *0.186* |
| *234* | *–35.27* | *–48.54* | *–75.47* | *–103.88* | *62.7* | *0.135* | *0.143* |
| *252* | *–18.54* | *–57.06* | *–39.68* | *–122.11* | *59.5* | *0.157* | *0.111* |
| *270* | *0.00* | *–60.00* | *0.00* | *–128.40* | *55.7* | *0.177* | *0.095* |
| *288* | *18.54* | *–57.06* | *39.68* | *–122.11* | *51.7* | *0.201* | *0.091* |
| *306* | *35.27* | *–48.54* | *75.47* | *–103.88* | *48.0* | *0.234* | *0.098* |
| *324* | *48.54* | *–35.27* | *103.88* | *–75.47* | *44.1* | *0.282* | *0.102* |
| *342* | *57.06* | *–18.54* | *122.11* | *–39.68* | *42.5* | *0.382* | *0.152* |
| $M' = 70; M = 172.51$ | | | | | | | |
| *0* | *70.00* | *0.00* | *172.51* | *0.00* | *39.8* | *0.565* | *0.198* |
| *18* | *66.57* | *21.63* | *164.07* | *53.31* | *40.8* | *0.686* | *0.268* |
| *36* | *56.63* | *41.14* | *139.56* | *101.40* | *42.5* | *0.695* | *0.304* |
| *270* | *0.00* | *–70.00* | *0.00* | *–172.51* | *58.4* | *0.165* | *0.057* |
| *288* | *21.63* | *–66.57* | *53.31* | *–164.07* | *52.1* | *0.185* | *0.054* |
| *306* | *41.14* | *–56.63* | *101.40* | *–139.56* | *46.6* | *0.215* | *0.060* |
| *324* | *56.63* | *–41.14* | *139.56* | *–101.40* | *41.1* | *0.258* | *0.059* |
| *342* | *66.57* | *–21.63* | *164.07* | *–53.31* | *39.6* | *0.382* | *0.113* |
| $M' = 80; M = 227.92$ | | | | | | | |
| *306* | *47.02* | *–64.72* | *133.97* | *–184.39* | *45.4* | *0.198* | *0.032* |

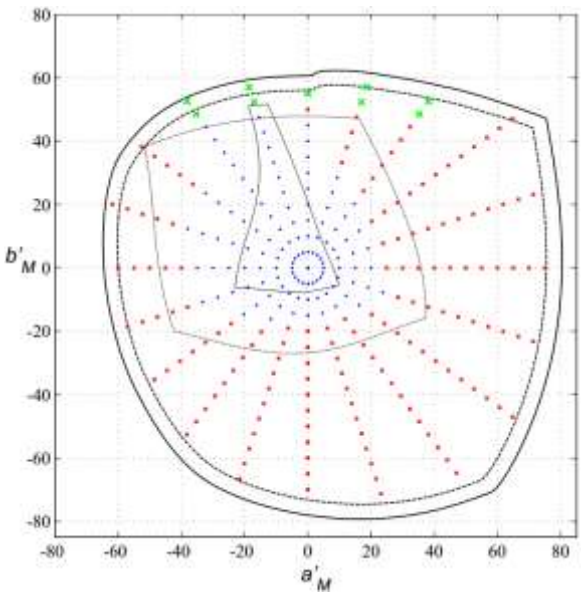


Figure 25 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 90$ on $a'_M, b'_M$ plane of the CAM02–UCS space

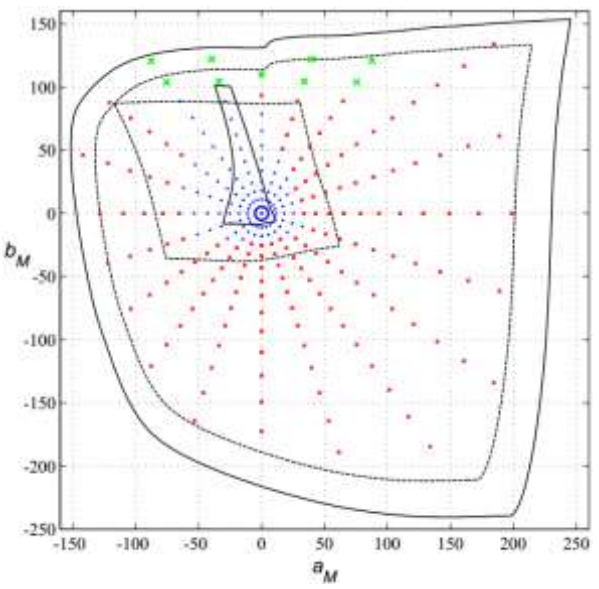


Figure 26 – Color points of existing colours gamut and color gamut transmitted and reproduced by UHDTV system for $J' = 90$ on $a_M, b_M$ plane of the CIECAM02 space

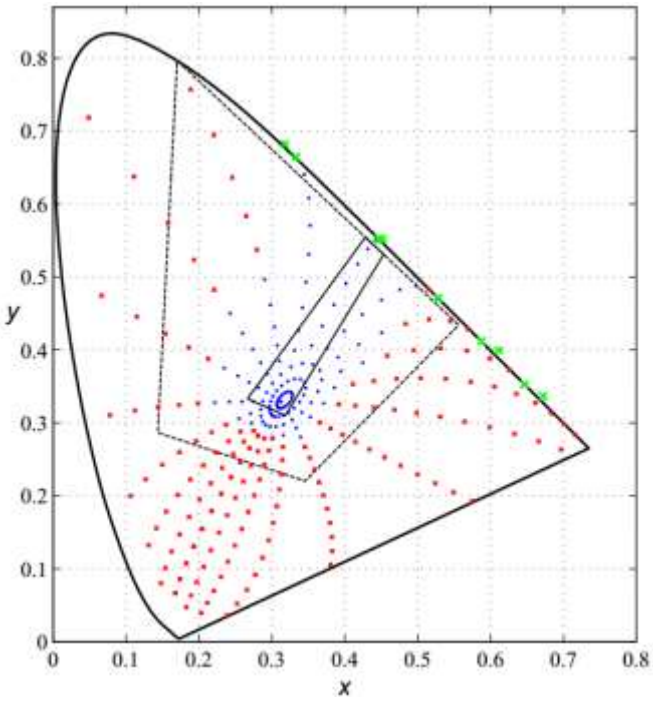


Figure 27 – Color points of existing colour gamut and of color gamut transmitted and reproduced by UHDTV system for $J' = 90$ on the $x, y$ plane of the CIE-31 space

Table 9 – Values of CAM02-UCS, CIECAM02 and $Y, x, y$ color grid nodes coordinates calculated for $J' = 90$ and corresponding $J = 84.11$

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| $M' = 10$; $M = 11.23$ | | | | | | | |
| 0 | 10.00 | 0.00 | 11.23 | 0.00 | 71.5 | 0.331 | 0.321 |
| 18 | 9.51 | 3.09 | 10.68 | 3.47 | 71.4 | 0.338 | 0.329 |
| 36 | 8.09 | 5.88 | 9.09 | 6.60 | 71.5 | 0.344 | 0.338 |
| 54 | 5.88 | 8.09 | 6.60 | 9.09 | 71.6 | 0.347 | 0.348 |
| 72 | 3.09 | 9.51 | 3.47 | 10.68 | 71.9 | 0.345 | 0.356 |
| 90 | 0.00 | 10.00 | 0.00 | 11.23 | 72.3 | 0.339 | 0.360 |
| 108 | –3.09 | 9.51 | –3.47 | 10.68 | 72.7 | 0.331 | 0.361 |
| 126 | –5.88 | 8.09 | –6.60 | 9.09 | 73.1 | 0.322 | 0.357 |
| 144 | –8.09 | 5.88 | –9.09 | 6.60 | 73.3 | 0.313 | 0.351 |
| 162 | –9.51 | 3.09 | –10.68 | 3.47 | 73.5 | 0.307 | 0.344 |
| 180 | –10.00 | 0.00 | –11.23 | 0.00 | 73.5 | 0.302 | 0.337 |
| 198 | –9.51 | –3.09 | –10.68 | –3.47 | 73.5 | 0.298 | 0.330 |
| 216 | –8.09 | –5.88 | –9.09 | –6.60 | 73.4 | 0.297 | 0.323 |
| 234 | –5.88 | –8.09 | –6.60 | –9.09 | 73.2 | 0.297 | 0.318 |
| 252 | –3.09 | –9.51 | –3.47 | –10.68 | 73.0 | 0.298 | 0.313 |
| 270 | 0.00 | –10.00 | 0.00 | –11.23 | 72.8 | 0.301 | 0.310 |
| 288 | 3.09 | –9.51 | 3.47 | –10.68 | 72.5 | 0.304 | 0.309 |
| 306 | 5.88 | –8.09 | 6.60 | –9.09 | 72.3 | 0.309 | 0.309 |
| 324 | 8.09 | –5.88 | 9.09 | –6.60 | 72.0 | 0.315 | 0.310 |
| 342 | 9.51 | –3.09 | 10.68 | –3.47 | 71.7 | 0.323 | 0.314 |
| $M' = 20$; $M = 25.34$ | | | | | | | |
| 0 | 20.00 | 0.00 | 25.34 | 0.00 | 70.0 | 0.353 | 0.308 |
| 18 | 19.02 | 6.18 | 24.10 | 7.83 | 69.8 | 0.371 | 0.327 |
| 36 | 16.18 | 11.76 | 20.50 | 14.89 | 69.9 | 0.386 | 0.349 |
| 54 | 11.76 | 16.18 | 14.89 | 20.50 | 70.3 | 0.395 | 0.371 |
| 72 | 6.18 | 19.02 | 7.83 | 24.10 | 71.0 | 0.391 | 0.390 |
| 90 | 0.00 | 20.00 | 0.00 | 25.34 | 71.9 | 0.376 | 0.403 |
| 108 | –6.18 | 19.02 | –7.83 | 24.10 | 72.9 | 0.355 | 0.406 |
| 126 | –11.76 | 16.18 | –14.89 | 20.50 | 73.7 | 0.331 | 0.400 |
| 144 | –16.18 | 11.76 | –20.50 | 14.89 | 74.3 | 0.310 | 0.385 |
| 162 | –19.02 | 6.18 | –24.10 | 7.83 | 74.7 | 0.294 | 0.367 |
| 180 | –20.00 | 0.00 | –25.34 | 0.00 | 74.9 | 0.282 | 0.348 |
| 198 | –19.02 | –6.18 | –24.10 | –7.83 | 74.9 | 0.274 | 0.330 |
| 216 | –16.18 | –11.76 | –20.50 | –14.89 | 74.6 | 0.271 | 0.313 |
| 234 | –11.76 | –16.18 | –14.89 | –20.50 | 74.2 | 0.272 | 0.300 |
| *252* | *–6.18* | *–19.02* | *–7.83* | *–24.10* | *73.7* | *0.275* | *0.290* |
| *270* | *0.00* | *–20.00* | *0.00* | *–25.34* | *73.1* | *0.281* | *0.283* |
| *288* | *6.18* | *–19.02* | *7.83* | *–24.10* | *72.4* | *0.290* | *0.279* |
| *306* | *11.76* | *–16.18* | *14.89* | *–20.50* | *71.8* | *0.301* | *0.280* |
| 324 | 16.18 | –11.76 | 20.50 | –14.89 | 71.0 | 0.316 | 0.283 |
| 342 | 19.02 | –6.18 | 24.10 | –7.83 | 70.4 | 0.333 | 0.293 |
| $M' = 30$; $M = 43.06$ | | | | | | | |
| *0* | *30.00* | *0.00* | *43.06* | *0.00* | *68.0* | *0.381* | *0.293* |
| *18* | *28.53* | *9.27* | *40.95* | *13.31* | *67.8* | *0.415* | *0.324* |
| *36* | *24.27* | *17.63* | *34.84* | *25.31* | *68.1* | *0.440* | *0.358* |
| *54* | *17.63* | *24.27* | *25.31* | *34.84* | *68.7* | *0.458* | *0.393* |
| 72 | 9.27 | 28.53 | 13.31 | 40.95 | 69.9 | 0.451 | 0.424 |
| 90 | 0.00 | 30.00 | 0.00 | 43.06 | 71.5 | 0.424 | 0.449 |
| 108 | –9.27 | 28.53 | –13.31 | 40.95 | 73.2 | 0.385 | 0.462 |
| 126 | –17.63 | 24.27 | –25.31 | 34.84 | 74.6 | 0.342 | 0.458 |
| 144 | –24.27 | 17.63 | –34.84 | 25.31 | 75.7 | 0.303 | 0.432 |
| 162 | –28.53 | 9.27 | –40.95 | 13.31 | 76.5 | 0.274 | 0.401 |
| 180 | –30.00 | 0.00 | –43.06 | 0.00 | 76.9 | 0.253 | 0.365 |
| 198 | –28.53 | –9.27 | –40.95 | –13.31 | 76.8 | 0.242 | 0.329 |

Table 9 (end)

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| *216* | *–24.27* | *–17.63* | *–34.84* | *–25.31* | *76.5* | *0.237* | *0.298* |
| *234* | *–17.63* | *–24.27* | *–25.31* | *–34.84* | *75.6* | *0.241* | *0.275* |
| *252* | *–9.27* | *–28.53* | *–13.31* | *–40.95* | *74.7* | *0.247* | *0.258* |
| *270* | *0.00* | *–30.00* | *0.00* | *–43.06* | *73.6* | *0.257* | *0.247* |
| *288* | *9.27* | *–28.53* | *13.31* | *–40.95* | *72.3* | *0.271* | *0.242* |
| *306* | *17.63* | *–24.27* | *25.31* | *–34.84* | *71.1* | *0.290* | *0.243* |
| *324* | *24.27* | *–17.63* | *34.84* | *–25.31* | *69.7* | *0.314* | *0.250* |
| *342* | *28.53* | *–9.27* | *40.95* | *–13.31* | *68.7* | *0.346* | *0.267* |
| $M' = 40$; $M = 65.32$ | | | | | | | |
| *0* | *40.00* | *0.00* | *65.32* | *0.00* | *65.6* | *0.415* | *0.274* |
| *18* | *38.04* | *12.36* | *62.12* | *20.18* | *65.5* | *0.468* | *0.318* |
| *36* | *32.36* | *23.51* | *52.84* | *38.39* | *66.0* | *0.504* | *0.362* |
| *54* | *23.51* | *32.36* | *38.39* | *52.84* | *66.8* | *0.532* | *0.403* |
| *72* | *12.36* | *38.04* | *20.18* | *62.12* | *68.7* | *0.516* | *0.442* |
| 90 | 0.00 | 40.00 | 0.00 | 65.32 | 71.0 | 0.476 | 0.483 |
| 108 | –12.36 | 38.04 | –20.18 | 62.12 | 73.5 | 0.418 | 0.518 |
| 126 | –23.51 | 32.36 | –38.39 | 52.84 | 75.8 | 0.351 | 0.531 |
| 144 | –32.36 | 23.51 | –52.84 | 38.39 | 77.4 | 0.290 | 0.497 |
| 162 | –38.04 | 12.36 | –62.12 | 20.18 | 78.8 | 0.243 | 0.450 |
| *180* | *–40.00* | *0.00* | *–65.32* | *0.00* | *79.6* | *0.213* | *0.388* |
| *198* | *–38.04* | *–12.36* | *–62.12* | *–20.18* | *79.7* | *0.199* | *0.327* |
| *216* | *–32.36* | *–23.51* | *–52.84* | *–38.39* | *79.2* | *0.196* | *0.275* |
| *234* | *–23.51* | *–32.36* | *–38.39* | *–52.84* | *77.7* | *0.206* | *0.242* |
| *252* | *–12.36* | *–38.04* | *–20.18* | *–62.12* | *76.1* | *0.216* | *0.218* |
| *270* | *0.00* | *–40.00* | *0.00* | *–65.32* | *74.2* | *0.231* | *0.203* |
| *288* | *12.36* | *–38.04* | *20.18* | *–62.12* | *72.2* | *0.250* | *0.198* |
| *306* | *23.51* | *–32.36* | *38.39* | *–52.84* | *70.1* | *0.276* | *0.201* |
| *324* | *32.36* | *–23.51* | *52.84* | *–38.39* | *68.0* | *0.310* | *0.209* |
| *342* | *38.04* | *–12.36* | *62.12* | *–20.18* | *66.5* | *0.359* | *0.236* |
| $M' = 50$; $M = 93.28$ | | | | | | | |
| *0* | *50.00* | *0.00* | *93.28* | *0.00* | *62.8* | *0.455* | *0.253* |
| *18* | *47.55* | *15.45* | *88.71* | *28.82* | *62.9* | *0.531* | *0.309* |
| *36* | *40.45* | *29.39* | *75.46* | *54.83* | *63.9* | *0.573* | *0.357* |
| *54* | *29.39* | *40.45* | *54.83* | *75.46* | *64.9* | *0.599* | *0.389* |
| *72* | *15.45* | *47.55* | *28.82* | *88.71* | *67.3* | *0.569* | *0.429* |
| *90* | *0.00* | *50.00* | *0.00* | *93.28* | *70.5* | *0.515* | *0.483* |
| 108 | –15.45 | 47.55 | –28.82 | 88.71 | 73.9 | 0.442 | 0.551 |
| 126 | –29.39 | 40.45 | –54.83 | 75.46 | 77.3 | 0.351 | 0.608 |
| *144* | *–40.45* | *29.39* | *–75.46* | *54.83* | *79.6* | *0.265* | *0.584* |
| *162* | *–47.55* | *15.45* | *–88.71* | *28.82* | *81.9* | *0.193* | *0.524* |
| *180* | *–50.00* | *0.00* | *–93.28* | *0.00* | *83.5* | *0.154* | *0.423* |
| *198* | *–47.55* | *–15.45* | *–88.71* | *–28.82* | *84.0* | *0.144* | *0.322* |

| $h'$ | $a'_M$ | $b'_M$ | $a_M$ | $b_M$ | $Y$ | $x$ | $y$ |
|---|---|---|---|---|---|---|---|
| *216* | *–40.45* | *–29.39* | *–75.46* | *–54.83* | *83.5* | *0.150* | *0.243* |
| *234* | *–29.39* | *–40.45* | *–54.83* | *–75.46* | *80.8* | *0.171* | *0.202* |
| *252* | *–15.45* | *–47.55* | *–28.82* | *–88.71* | *78.2* | *0.186* | *0.172* |
| *270* | *0.00* | *–50.00* | *0.00* | *–93.28* | *75.3* | *0.205* | *0.155* |
| *288* | *15.45* | *–47.55* | *28.82* | *–88.71* | *72.1* | *0.227* | *0.150* |
| *306* | *29.39* | *–40.45* | *54.83* | *–75.46* | *68.9* | *0.259* | *0.155* |
| *324* | *40.45* | *–29.39* | *75.46* | *–54.83* | *65.6* | *0.302* | *0.163* |
| *342* | *47.55* | *–15.45* | *88.71* | *–28.82* | *63.7* | *0.371* | *0.201* |
| $M' = 60$; $M = 128.4$ | | | | | | | |
| *0* | *60.00* | *0.00* | *128.40* | *0.00* | *59.7* | *0.500* | *0.230* |
| *18* | *57.06* | *18.54* | *122.11* | *39.68* | *60.3* | *0.599* | *0.294* |
| *36* | *48.54* | *35.27* | *103.88* | *75.47* | *61.8* | *0.635* | *0.340* |
| *54* | *35.27* | *48.54* | *75.47* | *103.88* | *62.9* | *0.647* | *0.353* |
| *72* | *18.54* | *57.06* | *39.68* | *122.11* | *66.0* | *0.611* | *0.400* |
| *108* | *–18.54* | *57.06* | *–39.68* | *122.11* | *74.5* | *0.452* | *0.552* |
| *126* | *–35.27* | *48.54* | *–75.47* | *103.88* | *79.2* | *0.333* | *0.665* |
| *144* | *–48.54* | *35.27* | *–103.88* | *75.47* | *82.3* | *0.221* | *0.695* |
| *162* | *–57.06* | *18.54* | *–122.11* | *39.68* | *86.0* | *0.111* | *0.638* |
| *180* | *–60.00* | *0.00* | *–128.40* | *0.00* | *89.0* | *0.067* | *0.475* |
| *198* | *–57.06* | *–18.54* | *–122.11* | *–39.68* | *90.7* | *0.078* | *0.311* |
| *216* | *–48.54* | *–35.27* | *–103.88* | *–75.47* | *90.7* | *0.106* | *0.200* |
| *234* | *–35.27* | *–48.54* | *–75.47* | *–103.88* | *85.6* | *0.142* | *0.156* |
| *252* | *–18.54* | *–57.06* | *–39.68* | *–122.11* | *81.6* | *0.162* | *0.124* |
| *270* | *0.00* | *–60.00* | *0.00* | *–128.40* | *77.0* | *0.183* | *0.108* |
| *288* | *18.54* | *–57.06* | *39.68* | *–122.11* | *72.0* | *0.206* | *0.103* |
| *306* | *35.27* | *–48.54* | *75.47* | *–103.88* | *67.4* | *0.240* | *0.110* |
| *324* | *48.54* | *–35.27* | *103.88* | *–75.47* | *62.6* | *0.287* | *0.116* |
| *342* | *57.06* | *–18.54* | *122.11* | *–39.68* | *60.3* | *0.380* | *0.163* |
| $M' = 70$; $M = 172.51$ | | | | | | | |
| *0* | *70.00* | *0.00* | *172.51* | *0.00* | *56.4* | *0.549* | *0.205* |
| *18* | *66.57* | *21.63* | *164.07* | *53.31* | *57.7* | *0.666* | *0.275* |
| *36* | *56.63* | *41.14* | *139.56* | *101.40* | *59.8* | *0.683* | *0.314* |
| *252* | *–21.63* | *–66.57* | *–53.31* | *–164.07* | *87.4* | *0.148* | *0.081* |
| *270* | *0.00* | *–70.00* | *0.00* | *–172.51* | *80.0* | *0.168* | *0.067* |
| *288* | *21.63* | *–66.57* | *53.31* | *–164.07* | *72.4* | *0.189* | *0.064* |
| *306* | *41.14* | *–56.63* | *101.40* | *–139.56* | *65.6* | *0.221* | *0.070* |
| *324* | *56.63* | *–41.14* | *139.56* | *–101.40* | *58.7* | *0.266* | *0.071* |
| *342* | *66.57* | *–21.63* | *164.07* | *–53.31* | *56.5* | *0.383* | *0.125* |
| $M' = 80$; $M = 227.92$ | | | | | | | |
| *36* | *64.72* | *47.02* | *184.39* | *133.97* | *58.1* | *0.716* | *0.284* |
| *306* | *47.02* | *–64.72* | *133.97* | *–184.39* | *63.8* | *0.203* | *0.040* |
| *324* | *64.72* | *–47.02* | *184.39* | *–133.97* | *54.4* | *0.238* | *0.036* |

## CONCLUSION

Proposed in this paper method of constructing an equidistant grid sites of which are presented in uniform space CAM02-UCS, and in each plane of constant relative lightness are evenly spaced along the radial direction corresponding to a given hue and evenly fill the circle corresponding to given levels of colorfulness, allows to build a set of test color patterns that can be used directly for the uniform assessment of color rendering fidelity for TV and other video systems in terms of the relative lightness, hue and colorfulness.

Considering that the space CAM02-UCS is currently based on the most complete data on characteristics of color appearance and is a compromise with respect to a subjective assessment of large and small color difference, the use of grid, uniformly filling existing color gamut, in particular color gamut, transmitted and reproduced by TV systems as a basis for constructing a system of test color patterns can be seen as a step towards the development of the colorimetric methods of measurements in the TV and other video applications environment.

It should be noted the problem of compromise between the desired detailed color rendering fidelity assessment and amount of calculations. As can be seen from the tables and figures presented in [1] and in this paper, the maximum step, which should be provided in the tables for levels of relative lightness $J'$, as

well as for the coordinates $a'_M, b'_M$ of the orthogonal grid points or levels of colorfulness $M'$ of the polar grid, would have to be no more than 5 CIE units, thus still possible to characterize color fidelity of TV system in region of relative lightness close to zero (black level or close to the black level) or close to the maximum (white level or close to the white level). In [1] and in this paper, as an implementation of this compromise the step of 10 CIE units for the relative lightness and of 5 CIE units for chromaticity is selected in figures and of 10 CIE units in tables.

The above example of such a grid in Figures 1–27 and in Tables 1–9 refers to the adapting luminance of 50 cd/m$^2$, and in this sense presented grid expresses a special case of such an assessment. It refers to the luminance of the white $250\,кд/м^2$, i.e., it refers to real level of luminance of the screen of modern display panels.

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