Colorimetric data for system lines TLS18 −> ORS18, TLS00, NRS18, SRS18

For input ***LCH*a0*** (TLS18) and output ***LCH*am*** for 4 systems (***m*** = 0 to 4)
Six CIELAB hue angles of device ORS18: (37.7 96.4 150.9 236.0 305.0 353.7);
Six CIELAB hue angles of device TLS00: (40.0 102.8 136.0 196.4 306.3 328.2);
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
Six CIELAB hue angles of device SRS18: (30.0 90.0 150.0 210.0 270.0 330.0);

no.	*Colour*	−>TLS18 *LCH*a0*			−>TLS18 *n*, c*, H*ai0*			ORS18 *LCH*a1*			TLS00 *LCH*a2*			NRS18 *LCH*a3*			SRS18 *LCH*a4*		
01	*O=o00y*	50.9	43.6	35	0.3	0.5	35	48.5	37.2	35	44.6	52.4	35	52.8	35.3	35	52.8	37.0	35
02	*o10y*	53.0	40.5	42	0.3	0.5	42	50.0	39.7	42	45.0	49.2	42	52.8	33.8	42	52.8	35.2	42
03	*o20y*	55.0	38.4	49	0.3	0.5	49	52.5	37.9	49	47.4	46.3	49	52.8	32.8	49	52.8	34.1	49
04	*o30y*	56.8	37.2	55	0.3	0.5	55	54.7	36.8	55	49.4	44.7	55	52.8	32.4	55	52.8	33.6	55
05	*o40y*	58.8	36.4	62	0.3	0.5	62	57.2	36.2	62	51.7	43.4	62	52.8	32.3	62	52.8	33.5	62
06	*o50y*	60.8	36.1	69	0.3	0.5	69	59.8	36.0	69	54.1	42.9	69	52.8	32.8	69	52.8	33.9	69
07	*o60y*	62.9	36.4	76	0.3	0.5	76	62.3	36.5	76	56.4	43.0	76	52.8	33.8	76	52.8	34.9	76
08	*o070y*	64.9	37.2	83	0.3	0.5	83	64.8	37.5	83	58.8	43.7	83	52.8	35.4	83	52.8	36.4	83
09	*o80y*	67.0	38.6	90	0.3	0.5	90	67.4	39.1	90	61.1	45.2	90	52.8	37.7	90	52.8	38.7	90
10	*o90y*	68.7	40.5	96	0.3	0.5	96	69.5	41.2	96	63.1	47.1	96	52.8	37.1	96	52.8	36.7	96
11	*Y=y00l*	70.8	43.5	103	0.3	0.5	103	67.3	43.9	103	65.4	46.5	103	52.8	34.8	103	52.8	35.0	103

Goal: Transfer coordinates ***LCH*a0*** (system m=0) to ***LCH*am*** (system m=1 to 4)

The given data ***LCH*a0*** include the device hue ***H*a0***
Integer (i) device hue: $H^*_{ai0} = round\,(H^*_{a0})$ (1)

Fetch device data ***LCH*a,M0*** from table with 361 entries for ***H*ai0*** from 0 to 360 degrees
Lightness, chroma, hue: $LCH^*_{a,M0} = LCH^*_{a,M0}\,[\,H^*_{ai0}\,]$ (2)

Calculate ***lcnw**** data from ***LC*a0*** and ***LC*a,M0***:
Relative lightness: $l^* = [\,L^*_0 - L^*_{N0}\,] / [\,L^*_{W0} - L^*_{N0}\,]$ (3)
Relative chroma: $c^* = C^*_{a0} / C^*_{a,M0}$ (4)
Relative Blackness: $n^* = 1 - l^* + c^*\,[\,L^*_{M0} - L^*_{N0}\,] / [\,L^*_{W0} - L^*_{N0}\,]$ (5)

Fetch device data ***LCH*a,Mm*** from table with 361 entries for ***H*ai0*** from 0 to 360 degrees
lightness, chroma, hue: $LCH^*_{a,Mm} = LCH^*_{a,Mm}\,[\,H^*_{ai0}\,]$ (6)

For any input or output device (m=0 to 4) it is valid for constant ***n*, c*, l*, H*a***:
CIELAB lightness: $L^*_m = L^*_{am} = L^*_{Nm} + l^*\,[\,L^*_{Wm} - L^*_{Nm}\,]$ (7)
Adated CIELAB chroma: $C^*_{am} = c^*\,C^*_{a,Mm}$ (8)
Adated CIELAB hue: $H^*_{am} = H^*_{a0}$ (9)

Result: device dependent adapted CIELAB data of 4 systems m=1 to 4:
lightness, chroma, hue: ***LCH*am*** (10)

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Colorimetric data for system lines TLS18 −> ORS18, TLS00, NRS18, SRS18

For input ***olv*30*** (TLS18) and output ***LCH*am*** for 4 systems (***m*** = 0 to 4)
Six CIELAB hue angles of device ORS18: (37.7 96.4 150.9 236.0 305.0 353.7);
Six CIELAB hue angles of device TLS00: (40.0 102.8 136.0 196.4 306.3 328.2);
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
Six CIELAB hue angles of device SRS18: (30.0 90.0 150.0 210.0 270.0 330.0);

no.	*Colour*	−>TLS18 *olv*30*			−>TLS18 *n*, c*, H*si0*			ORS18 *LCH*a1*			TLS00 *LCH*a2*			NRS18 *LCH*a3*			SRS18 *LCH*a4*		
01	*O=o00y*	0.7	0.2	0.2	0.3	0.5	30	48.5	37.2	35	44.6	52.4	35	52.8	35.3	35	52.8	37.0	35
02	*o10y*	0.7	0.25	0.2	0.3	0.5	35	50.0	39.7	42	45.0	49.2	42	52.8	33.8	42	52.8	35.2	42
03	*o20y*	0.7	0.3	0.2	0.3	0.5	41	52.5	37.9	49	47.4	46.3	49	52.8	32.8	49	52.8	34.1	49
04	*o30y*	0.7	0.35	0.2	0.3	0.5	47	54.7	36.8	55	49.4	44.7	55	52.8	32.4	55	52.8	33.6	55
05	*o40y*	0.7	0.4	0.2	0.3	0.5	53	57.2	36.2	62	51.7	43.4	62	52.8	32.3	62	52.8	33.5	62
06	*o50y*	0.7	0.45	0.2	0.3	0.5	60	59.8	36.0	69	54.1	42.9	69	52.8	32.8	69	52.8	33.9	69
07	*o60y*	0.7	0.5	0.2	0.3	0.5	67	62.3	36.5	76	56.4	43.0	76	52.8	33.8	76	52.8	34.9	76
08	*o070y*	0.7	0.55	0.2	0.3	0.5	73	64.8	37.5	83	58.8	43.7	83	52.8	35.4	83	52.8	36.4	83
09	*o80y*	0.7	0.6	0.2	0.3	0.5	79	67.4	39.1	90	61.1	45.2	90	52.8	37.7	90	52.8	38.7	90
10	*o90y*	0.7	0.65	0.2	0.3	0.5	84	69.5	41.2	96	63.1	47.1	96	52.8	37.1	96	52.8	36.7	96
11	*Y=y00l*	0.7	0.7	0.2	0.3	0.5	90	67.3	43.9	103	65.4	46.5	103	52.8	34.8	103	52.8	35.0	103

Goal: Transfer coordinates ***olv*30*** (system m=0) to ***LCH*am*** (system m=1 to 4)
The following equations for relative blackness and chroma are valid for any device:
$n^* = 1 - max\,(o^*_{30}, l^*_{30}, v^*_{30})$ (1)
$c^* = max\,(o^*_{30}, l^*_{30}, v^*_{30}) - min\,(o^*_{30}, l^*_{30}, v^*_{30})$ (2)
For the calculation of the missing relative device hue asume
as a starting point that the three values ***olv*30*** belong to the standard (s) device SRS18:
relative red-green chroma: $a^*_{r0} = o^*_{30}\,cos(30) + l^*_{30}\,cos(150)$ (3)
relative yellow-blue chroma: $b^*_{r0} = o^*_{30}\,sin(30) + l^*_{30}\,sin(150) - v^*_{30}\,sin(270)$ (4)
Standard integer hue: $H^*_{si0} = round\,[\,atan\,(b^*_{r0} / a^*_{r0})\,]$ (5)
Fetch device integer hue: $H^*_{ai0} = H^*_{si\_ai}\,[\,H^*_{si0}\,]$ (6)

Fetch device data ***LCH*a,M0*** from table with 361 entries for ***H*ai0*** from 0 to 360 degrees
Lightness, chroma, hue: $LCH^*_{a,M0} = LCH^*_{a,M0}\,[\,H^*_{ai0}\,]$ (7)
Fetch device data ***LCH*a,Mm*** from table with 361 entries for ***H*ai0*** from 0 to 360 degrees
lightness, chroma, hue: $LCH^*_{a,Mm} = LCH^*_{a,Mm}\,[\,H^*_{ai0}\,]$ (8)

For any input or output device (m=0 to 4) it is valid for constant ***n*, c*, l*, H*a***:
CIELAB lightness: $L^*_m = L^*_{am} = L^*_{Nm} + l^*\,[\,L^*_{Wm} - L^*_{Nm}\,]$ (9)
Adated CIELAB chroma: $C^*_{am} = c^*\,C^*_{a,Mm}$ (10)
Adated CIELAB hue: $H^*_{am} = H^*_{a,M0} = H^*_{a,Mm}$ (11)
Result: device dependent adapted CIELAB data of 4 systems m=1 to 4:
lightness, chroma, hue: ***LCH*am*** (12)

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