Colorimetric data for system line NRS18 –> ORS18

For input ***LCH*a0*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH*a,M1***, ***olv*3,M1***, ***LCH*a1***, ***olv*31*** of the system 1: ORS18
Six CIELAB hue angles of device ORS18: (37.7 96.4 150.9 236.0 305.0 353.7);

	–>NRS18			–>NRS18			ORS18			ORS18			ORS18			ORS18			0 1
no.	*Colour*	***LCH*a0***			***n**, ***c**, ***H*ai0***			***LCH*a,M1***			***olv*3,M1***			***LCH*a1***			***olv*31***		
01	*R=r00j*	52.8	38.5	25	0.3	0.5	25	48.0	71.2	25	1.0	0.0	0.29	48.5	35.6	25	0.7	0.2	0.34
02	*r10j*	52.8	36.2	32	0.3	0.5	32	48.0	73.2	32	1.0	0.0	0.13	48.5	36.6	32	0.7	0.2	0.26
03	*r20j*	52.8	34.4	39	0.3	0.5	39	48.9	81.6	39	1.0	0.02	0.0	48.9	40.8	39	0.7	0.21	0.2
04	*r30j*	52.8	33.1	46	0.3	0.5	46	53.9	77.2	46	1.0	0.14	0.0	51.5	38.6	46	0.7	0.27	0.2
05	*r40j*	52.8	32.5	52	0.3	0.5	52	58.3	74.6	52	1.0	0.24	0.0	53.6	37.3	52	0.7	0.32	0.2
06	*r50j*	52.8	32.3	59	0.3	0.5	59	63.3	72.7	59	1.0	0.36	0.0	56.2	36.4	59	0.7	0.38	0.2
07	*r60j*	52.8	32.6	66	0.3	0.5	66	68.4	72.0	66	1.0	0.48	0.0	58.7	36.0	66	0.7	0.44	0.2
08	*r070j*	52.8	33.2	72	0.3	0.5	72	72.7	72.3	72	1.0	0.58	0.0	60.9	36.1	72	0.7	0.49	0.2
09	*r80j*	52.8	34.4	79	0.3	0.5	79	77.8	73.6	79	1.0	0.7	0.0	63.4	36.8	79	0.7	0.55	0.2
10	*r90j*	52.8	36.3	86	0.3	0.5	86	82.9	76.2	86	1.0	0.82	0.0	65.9	38.1	86	0.7	0.61	0.2
11	*J=j00g*	52.8	38.6	92	0.3	0.5	92	87.2	79.4	92	1.0	0.93	0.0	68.1	39.7	92	0.7	0.66	0.2

Goal: Transfer coordinates ***LCH*a0*** (system m=0) to ***LCH*a1*** and ***olv*31*** (system m=1)
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,M1*** and ***olv*3,M1*** from table with 361 entries for ***H*ai0***
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (6)
"Red, Green, Blue" ***rgb1*** data:-Datei: $olv^*_{3,M1} = olv^*_{3,M1}\,[\,H^*_{ai0}\,]$ (7)

For any input or output device (m=0 to 1) it is valid for constant ***n**, ***c**, ***l**, ***H*a***:
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (8)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (9)
Adated CIELAB hue: $H^*_{a1} = H^*_{a0}$ (10)
"red, green, blue" ***rgb1*** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (11)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: ***LCH*a1*** and ***rgb1*** data: ***olv*31*** (12)

ZE020–7

Colorimetric data for system line NRS18 –> ORS18

For input ***olv*30*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH*a,M1***, ***olv*3,M1***, ***LCH*a1***, ***olv*31*** of the system 1: ORS18
Six CIELAB hue angles of device ORS18: (37.7 96.4 150.9 236.0 305.0 353.7);

	–>NRS18			–>NRS18			ORS18			ORS18			ORS18			ORS18			0 1
no.	*Colour*	***olv*30=rgb*30***, ***n**, ***c**, ***H*si0***			***LCH*a,M1***			***olv*3,M1***			***LCH*a1***			***olv*31***					
01	*R=r00j*	0.7	0.2	0.2	0.3	0.5	30	48.0	71.2	25	1.0	0.0	0.29	48.5	35.6	25	0.7	0.2	0.34
02	*r10j*	0.7	0.25	0.2	0.3	0.5	35	48.0	73.2	32	1.0	0.0	0.13	48.5	36.6	32	0.7	0.2	0.26
03	*r20j*	0.7	0.3	0.2	0.3	0.5	41	48.9	81.6	39	1.0	0.02	0.0	48.9	40.8	39	0.7	0.21	0.2
04	*r30j*	0.7	0.35	0.2	0.3	0.5	47	53.9	77.2	46	1.0	0.14	0.0	51.5	38.6	46	0.7	0.27	0.2
05	*r40j*	0.7	0.4	0.2	0.3	0.5	53	58.3	74.6	52	1.0	0.24	0.0	53.6	37.3	52	0.7	0.32	0.2
06	*r50j*	0.7	0.45	0.2	0.3	0.5	60	63.3	72.7	59	1.0	0.36	0.0	56.2	36.4	59	0.7	0.38	0.2
07	*r60j*	0.7	0.5	0.2	0.3	0.5	67	68.4	72.0	66	1.0	0.48	0.0	58.7	36.0	66	0.7	0.44	0.2
08	*r070j*	0.7	0.55	0.2	0.3	0.5	73	72.7	72.3	72	1.0	0.58	0.0	60.9	36.1	72	0.7	0.49	0.2
09	*r80j*	0.7	0.6	0.2	0.3	0.5	79	77.8	73.6	79	1.0	0.7	0.0	63.4	36.8	79	0.7	0.55	0.2
10	*r90j*	0.7	0.65	0.2	0.3	0.5	85	82.9	76.2	86	1.0	0.82	0.0	65.9	38.1	86	0.7	0.61	0.2
11	*J=j00g*	0.7	0.7	0.2	0.3	0.5	90	87.2	79.4	92	1.0	0.93	0.0	68.1	39.7	92	0.7	0.66	0.2

Goal: Transfer coordinates ***olv*30*** (system m=0) to ***LCH*a1*** and ***olv*31*** (system m=1)
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 assume
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,M1*** from table with 361 entries for ***H*ai0*** from 0 to 360 degrees
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (8)

For any input or output device (m=0 to 1) it is valid for constant ***n**, ***c**, ***l**, ***H*a***:
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (9)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (10)
Adated CIELAB hue: $H^*_{a1} = H^*_{a,M0} = H^*_{a,M1}$ (11)
"red, green, blue" ***rgb1*** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (12)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: ***LCH*a1*** and ***rgb1*** data: ***olv*31*** (13)

ZE021–7

Colorimetric data for system line NRS18 -> TLS00

For input ***LCH*a0*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH*a,M1**, ***olv*a,M1**, ***LCH*a1**, ***olv*31*** of the system 1: TLS00
Six CIELAB hue angles of device TLS00: (40.0 102.8 136.0 196.4 306.3 328.2);

	->NRS18	->NRS18	TLS00	TLS00	TLS00	TLS00	
no. Colour	***LCH*a0***	***n*, *c*, *H*a0***	***LCH*a,M1***	***olv*3,M1***	***LCH*a1***	***olv*31***	0 1
01 *R=r00j*	52.8 38.5 25	0.3 0.5 25	51.9 96.2 25	1.0 0.0 0.21	45.0 48.1 25	0.7 0.2 0.3	
02 *r10j*	52.8 36.2 32	0.3 0.5 32	51.3 102 32	1.0 0.0 0.11	44.7 50.9 32	0.7 0.2 0.26	
03 *r20j*	52.8 34.4 39	0.3 0.5 39	50.6 110 39	1.0 0.0 0.01	44.4 54.8 39	0.7 0.2 0.2	
04 *r30j*	52.8 33.1 46	0.3 0.5 46	54.5 94.9 46	1.0 0.1 0.0	46.3 47.4 46	0.7 0.25 0.2	
05 *r40j*	52.8 32.5 52	0.3 0.5 52	58.5 90.9 52	1.0 0.19 0.0	48.4 45.4 52	0.7 0.3 0.2	
06 *r50j*	52.8 32.3 59	0.3 0.5 59	63.2 87.7 59	1.0 0.3 0.0	50.7 43.9 59	0.7 0.35 0.2	
07 *r60j*	52.8 32.6 66	0.3 0.5 66	67.9 86.1 66	1.0 0.41 0.0	53.1 43.0 66	0.7 0.41 0.2	
08 *r070j*	52.8 33.2 72	0.3 0.5 72	72.0 85.7 72	1.0 0.51 0.0	55.1 42.8 72	0.7 0.45 0.2	
09 *r80j*	52.8 34.4 79	0.3 0.5 79	76.7 86.4 79	1.0 0.62 0.0	57.4 43.2 79	0.7 0.51 0.2	
10 *r90j*	52.8 36.3 86	0.3 0.5 86	81.4 88.5 86	1.0 0.73 0.0	59.8 44.3 86	0.7 0.57 0.2	
11 *J=j00g*	52.8 38.6 92	0.3 0.5 92	85.4 91.5 92	1.0 0.83 0.0	61.8 45.8 92	0.7 0.61 0.2	

Goal: Transfer coordinates ***LCH*a0*** (system m=0) to ***LCH*a1*** and ***olv*31*** (system m=1)
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,M1*** and ***olv*3,M1*** from table with 361 entries for ***H*ai0***
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (6)
"Red, Green, Blue" ***rgb*1*** data:-Datum $olv^*_{3,M1} = olv^*_{3,M1}\,[\,H^*_{ai0}\,]$ (7)

For any input or output device (m=0 to 1) it is valid for constant ***n*, *c*, *l*, *H*a*:
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (8)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (9)
Adated CIELAB hue: $H^*_{a1} = H^*_{a0}$ (10)
"red, green, blue" ***rgb*1*** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (11)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: ***LCH*a1*** and ***rgb*1*** data: ***olv*31*** (12)

ZE020-7

Colorimetric data for system line NRS18 -> TLS00

For input ***olv*30*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH*a,M1**, ***olv*a,M1**, ***LCH*a1**, ***olv*31*** of the system 1: TLS00
Six CIELAB hue angles of device TLS00: (40.0 102.8 136.0 196.4 306.3 328.2);

	->NRS18	->NRS18	TLS00	TLS00	TLS00	TLS00	
no. Colour	***olv*30=*rgb*30***	***n*, *c*, *H*si0***	***LCH*a,M1***	***olv*3,M1***	***LCH*a1***	***olv*31***	0 1
01 *R=r00j*	0.7 0.2 0.2	0.3 0.5 30	51.9 96.2 25	1.0 0.0 0.21	45.0 48.1 25	0.7 0.2 0.3	
02 *r10j*	0.7 0.25 0.2	0.3 0.5 35	51.3 102 32	1.0 0.0 0.11	44.7 50.9 32	0.7 0.2 0.26	
03 *r20j*	0.7 0.3 0.2	0.3 0.5 41	50.6 110 39	1.0 0.0 0.01	44.4 54.8 39	0.7 0.2 0.2	
04 *r30j*	0.7 0.35 0.2	0.3 0.5 47	54.5 94.9 46	1.0 0.1 0.0	46.3 47.4 46	0.7 0.25 0.2	
05 *r40j*	0.7 0.4 0.2	0.3 0.5 53	58.5 90.9 52	1.0 0.19 0.0	48.4 45.4 52	0.7 0.3 0.2	
06 *r50j*	0.7 0.45 0.2	0.3 0.5 60	63.2 87.7 59	1.0 0.3 0.0	50.7 43.9 59	0.7 0.35 0.2	
07 *r60j*	0.7 0.5 0.2	0.3 0.5 67	67.9 86.1 66	1.0 0.41 0.0	53.1 43.0 66	0.7 0.41 0.2	
08 *r070j*	0.7 0.55 0.2	0.3 0.5 73	72.0 85.7 72	1.0 0.51 0.0	55.1 42.8 72	0.7 0.45 0.2	
09 *r80j*	0.7 0.6 0.2	0.3 0.5 79	76.7 86.4 79	1.0 0.62 0.0	57.4 43.2 79	0.7 0.51 0.2	
10 *r90j*	0.7 0.65 0.2	0.3 0.5 85	81.4 88.5 86	1.0 0.73 0.0	59.8 44.3 86	0.7 0.57 0.2	
11 *J=j00g*	0.7 0.7 0.2	0.3 0.5 90	85.4 91.5 92	1.0 0.83 0.0	61.8 45.8 92	0.7 0.61 0.2	

Goal: Transfer coordinates ***olv*30*** (system m=0) to ***LCH*a1*** and ***olv*31*** (system m=1)
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 assume
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,M1*** from table with 361 entries for ***H*ai0*** from 0 to 360 degrees
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (8)

For any input or output device (m=0 to 1) it is valid for constant ***n*, *c*, *l*, *H*a*:
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (9)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (10)
Adated CIELAB hue: $H^*_{a1} = H^*_{a,M0} = H^*_{a,M1}$ (11)
"red, green, blue" ***rgb*1*** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (12)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: ***LCH*a1*** and ***rgb*1*** data: ***olv*31*** (13)

ZE021-7

See for similar files: http://www.ps.bam.de/ZE02/; www.ps.bam.de/ZE.HTM
Technical information: http://www.ps.bam.de Version 2.1, io=1,1

Colorimetric data for system line NRS18 −> FRS06

For input LCH^*_{a0} of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output $LCH^*_{a,M1}$, $olv^*_{3,M1}$, LCH^*_{a1}, olv^*_{31} of the system 1: FRS06
Six CIELAB hue angles of device FRS06: (36.7 91.6 143.4 232.0 312.1 337.2);

no. Colour	−>NRS18 LCH^*_{a0}	−>NRS18 n^*, c^*, H^*_{ai0}	FRS06 $LCH^*_{a,M1}$	FRS06 $olv^*_{3,M1}$	FRS06 LCH^*_{a1}	FRS06 olv^*_{31}	0 1
01 *R=r00j*	52.8 38.5 25	0.3 0.5 25	32.9 79.9 25	1.0 0.0 0.2	36.7 40.0 25	0.7 0.2 0.3	
02 *r10j*	52.8 36.2 32	0.3 0.5 32	32.7 83.9 32	1.0 0.0 0.08	36.6 41.9 32	0.7 0.2 0.24	
03 *r20j*	52.8 34.4 39	0.3 0.5 39	34.7 76.2 39	1.0 0.04 0.0	37.6 38.1 39	0.7 0.22 0.2	
04 *r30j*	52.8 33.1 46	0.3 0.5 46	41.1 72.6 46	1.0 0.17 0.0	40.8 36.3 46	0.7 0.28 0.2	
05 *r40j*	52.8 32.5 52	0.3 0.5 52	46.5 70.6 52	1.0 0.28 0.0	43.5 35.3 52	0.7 0.34 0.2	
06 *r50j*	52.8 32.3 59	0.3 0.5 59	52.9 69.3 59	1.0 0.41 0.0	46.7 34.6 59	0.7 0.4 0.2	
07 *r60j*	52.8 32.6 66	0.3 0.5 66	59.3 69.0 66	1.0 0.53 0.0	49.9 34.5 66	0.7 0.47 0.2	
08 *r070j*	52.8 33.2 72	0.3 0.5 72	64.8 69.7 72	1.0 0.64 0.0	52.7 34.8 72	0.7 0.52 0.2	
09 *r80j*	52.8 34.4 79	0.3 0.5 79	71.2 71.4 79	1.0 0.77 0.0	55.9 35.7 79	0.7 0.59 0.2	
10 *r90j*	52.8 36.3 86	0.3 0.5 86	77.6 74.3 86	1.0 0.9 0.0	59.1 37.2 86	0.7 0.65 0.2	
11 *J=j00g*	52.8 38.6 92	0.3 0.5 92	82.4 114 92	0.99 1.0 0.0	61.5 56.8 92	0.7 0.7 0.2	

Goal: Transfer coordinates LCH^*_{a0} (system m=0) to LCH^*_{a1} and olv^*_{31} (system m=1)
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 $LCH^*_{a,M1}$ and $olv^*_{3,M1}$ from table with 361 entries for H^*_{ai0}
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[H^*_{ai0}]$ (6)
"Red, Green, Blue" rgb_1 data:-Daten: $olv^*_{3,M1} = olv^*_{3,M1}\,[H^*_{ai0}]$ (7)

For any input or output device (m=0 to 1) it is valid for constant n^*, c^*, l^*, H^*_a:
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[L^*_{W1} - L^*_{N1}]$ (8)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (9)
Adated CIELAB hue: $H^*_{a1} = H^*_{a0}$ (10)
"red, green, blue" rgb_1 data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (11)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: LCH^*_{a1} and rgb_1 data: olv^*_{31} (12)

ZE020−7

Colorimetric data for system line NRS18 −> FRS06

For input olv^*_{30} of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output $LCH^*_{a,M1}$, $olv^*_{3,M1}$, LCH^*_{a1}, olv^*_{31} of the system 1: FRS06
Six CIELAB hue angles of device FRS06: (36.7 91.6 143.4 232.0 312.1 337.2);

no. Colour	−>NRS18 $olv^*_{30}=rgb^*_{30}$	−>NRS18 n^*, c^*, H^*_{si0}	FRS06 $LCH^*_{a,M1}$	FRS06 $olv^*_{3,M1}$	FRS06 LCH^*_{a1}	FRS06 olv^*_{31}	0 1
01 *R=r00j*	0.7 0.2 0.2	0.3 0.5 30	32.9 79.9 25	1.0 0.0 0.2	36.7 40.0 25	0.7 0.2 0.3	
02 *r10j*	0.7 0.25 0.2	0.3 0.5 35	32.7 83.9 32	1.0 0.0 0.08	36.6 41.9 32	0.7 0.2 0.24	
03 *r20j*	0.7 0.3 0.2	0.3 0.5 41	34.7 76.2 39	1.0 0.04 0.0	37.6 38.1 39	0.7 0.22 0.2	
04 *r30j*	0.7 0.35 0.2	0.3 0.5 47	41.1 72.6 46	1.0 0.17 0.0	40.8 36.3 46	0.7 0.28 0.2	
05 *r40j*	0.7 0.4 0.2	0.3 0.5 53	46.5 70.6 52	1.0 0.28 0.0	43.5 35.3 52	0.7 0.34 0.2	
06 *r50j*	0.7 0.45 0.2	0.3 0.5 60	52.9 69.3 59	1.0 0.41 0.0	46.7 34.6 59	0.7 0.4 0.2	
07 *r60j*	0.7 0.5 0.2	0.3 0.5 67	59.3 69.0 66	1.0 0.53 0.0	49.9 34.5 66	0.7 0.47 0.2	
08 *r070j*	0.7 0.55 0.2	0.3 0.5 73	64.8 69.7 72	1.0 0.64 0.0	52.7 34.8 72	0.7 0.52 0.2	
09 *r80j*	0.7 0.6 0.2	0.3 0.5 79	71.2 71.4 79	1.0 0.77 0.0	55.9 35.7 79	0.7 0.59 0.2	
10 *r90j*	0.7 0.65 0.2	0.3 0.5 85	77.6 74.3 86	1.0 0.9 0.0	59.1 37.2 86	0.7 0.65 0.2	
11 *J=j00g*	0.7 0.7 0.2	0.3 0.5 90	82.4 114 92	0.99 1.0 0.0	61.5 56.8 92	0.7 0.7 0.2	

Goal: Transfer coordinates olv^*_{30} (system m=0) to LCH^*_{a1} and olv^*_{31} (system m=1)
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 $LCH^*_{a,M1}$ from table with 361 entries for H^*_{ai0} from 0 to 360 degrees
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[H^*_{ai0}]$ (8)

For any input or output device (m=0 to 1) it is valid for constant n^*, c^*, l^*, H^*_a:
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[L^*_{W1} - L^*_{N1}]$ (9)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (10)
Adated CIELAB hue: $H^*_{a1} = H^*_{a,M0} = H^*_{a,M1}$ (11)
"red, green, blue" rgb_1 data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (12)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: LCH^*_{a1} and rgb_1 data: olv^*_{31} (13)

ZE021−7

BAM registration: 20070501-ZE02/L02E00N1.PS/.TXT
application for measurement of printer or monitor systems
BAM material: code=rha4ta

Colorimetric data for system line NRS18 -> TLS18

For input ***LCH*a0*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH*a,M1**, ***olv*a,M1**, ***LCH*a1**, ***olv*31*** of the system 1: TLS18
Six CIELAB hue angles of device TLS18: (34.9 103.3 136.9 196.5 304.3 328.1);

	->NRS18	->NRS18	TLS18	TLS18	TLS18	TLS18	
no. Colour	***LCH*a0***	***n*, *c*, *H*a0***	***LCH*a,M1***	***olv*3,M1***	***LCH*a1***	***olv*31***	0 1
01 *R=r00j*	52.8 38.5 25	0.3 0.5 25	53.7 95.9 25	1.0 0.0 0.15	51.3 47.9 25	0.7 0.2 0.27	
02 *r10j*	52.8 36.2 32	0.3 0.5 32	53.0 102 32	1.0 0.0 0.04	51.0 51.0 32	0.7 0.2 0.22	
03 *r20j*	52.8 34.4 39	0.3 0.5 39	55.2 83.4 39	1.0 0.06 0.0	52.1 41.7 39	0.7 0.23 0.2	
04 *r30j*	52.8 33.1 46	0.3 0.5 46	59.3 78.5 46	1.0 0.16 0.0	54.1 39.2 46	0.7 0.28 0.2	
05 *r40j*	52.8 32.5 52	0.3 0.5 52	62.8 75.5 52	1.0 0.25 0.0	55.9 37.8 52	0.7 0.33 0.2	
06 *r50j*	52.8 32.3 59	0.3 0.5 59	66.9 73.3 59	1.0 0.35 0.0	57.9 36.7 59	0.7 0.38 0.2	
07 *r60j*	52.8 32.6 66	0.3 0.5 66	71.0 72.3 66	1.0 0.46 0.0	60.0 36.1 66	0.7 0.43 0.2	
08 *r070j*	52.8 33.2 72	0.3 0.5 72	74.5 72.3 72	1.0 0.54 0.0	61.7 36.1 72	0.7 0.47 0.2	
09 *r80j*	52.8 34.4 79	0.3 0.5 79	78.6 73.3 79	1.0 0.65 0.0	63.8 36.6 79	0.7 0.52 0.2	
10 *r90j*	52.8 36.3 86	0.3 0.5 86	82.7 75.5 86	1.0 0.75 0.0	65.8 37.7 86	0.7 0.57 0.2	
11 *J=j00g*	52.8 38.6 92	0.3 0.5 92	86.2 78.4 92	1.0 0.84 0.0	67.6 39.2 92	0.7 0.62 0.2	

Goal: Transfer coordinates ***LCH*a0*** (system m=0) to ***LCH*a1*** and ***olv*31*** (system m=1)
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,M1*** and ***olv*3,M1*** from table with 361 entries for ***H*ai0***
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (6)
"Red, Green, Blue" ***rgb*1*** data:-Datum $olv^*_{3,M1} = olv^*_{3,M1}\,[\,H^*_{ai0}\,]$ (7)

For any input or output device (m=0 to 1) it is valid for constant ***n*, *c*, *l*, *H*a***:
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (8)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (9)
Adated CIELAB hue: $H^*_{a1} = H^*_{a0}$ (10)
"red, green, blue" ***rgb*1*** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (11)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: ***LCH*a1*** and ***rgb*1*** data: ***olv*31*** (12)

ZE020-7

Colorimetric data for system line NRS18 -> TLS18

For input ***olv*30*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH*a,M1**, ***olv*a,M1**, ***LCH*a1**, ***olv*31*** of the system 1: TLS18
Six CIELAB hue angles of device TLS18: (34.9 103.3 136.9 196.5 304.3 328.1);

	->NRS18	->NRS18	TLS18	TLS18	TLS18	TLS18	
no. Colour	***olv*30=*rgb*30***	***n*, *c*, *H*si0***	***LCH*a,M1***	***olv*3,M1***	***LCH*a1***	***olv*31***	0 1
01 *R=r00j*	0.7 0.2 0.2	0.3 0.5 30	53.7 95.9 25	1.0 0.0 0.15	51.3 47.9 25	0.7 0.2 0.27	
02 *r10j*	0.7 0.25 0.2	0.3 0.5 35	53.0 102 32	1.0 0.0 0.04	51.0 51.0 32	0.7 0.2 0.22	
03 *r20j*	0.7 0.3 0.2	0.3 0.5 41	55.2 83.4 39	1.0 0.06 0.0	52.1 41.7 39	0.7 0.23 0.2	
04 *r30j*	0.7 0.35 0.2	0.3 0.5 47	59.3 78.5 46	1.0 0.16 0.0	54.1 39.2 46	0.7 0.28 0.2	
05 *r40j*	0.7 0.4 0.2	0.3 0.5 53	62.8 75.5 52	1.0 0.25 0.0	55.9 37.8 52	0.7 0.33 0.2	
06 *r50j*	0.7 0.45 0.2	0.3 0.5 60	66.9 73.3 59	1.0 0.35 0.0	57.9 36.7 59	0.7 0.38 0.2	
07 *r60j*	0.7 0.5 0.2	0.3 0.5 67	71.0 72.3 66	1.0 0.46 0.0	60.0 36.1 66	0.7 0.43 0.2	
08 *r070j*	0.7 0.55 0.2	0.3 0.5 73	74.5 72.3 72	1.0 0.54 0.0	61.7 36.1 72	0.7 0.47 0.2	
09 *r80j*	0.7 0.6 0.2	0.3 0.5 79	78.6 73.3 79	1.0 0.65 0.0	63.8 36.6 79	0.7 0.52 0.2	
10 *r90j*	0.7 0.65 0.2	0.3 0.5 85	82.7 75.5 86	1.0 0.75 0.0	65.8 37.7 86	0.7 0.57 0.2	
11 *J=j00g*	0.7 0.7 0.2	0.3 0.5 90	86.2 78.4 92	1.0 0.84 0.0	67.6 39.2 92	0.7 0.62 0.2	

Goal: Transfer coordinates ***olv*30*** (system m=0) to ***LCH*a1*** and ***olv*31*** (system m=1)
The following equations for relative blackness and chroma are valid for any device:

$$n^* = 1 - max\,(o^*_{30}, l^*_{30}, v^*_{30}\,) \quad (1)$$
$$c^* = max\,(o^*_{30}, l^*_{30}, v^*_{30}\,) - min\,(o^*_{30}, l^*_{30}, v^*_{30}\,) \quad (2)$$

For the calculation of the missing relative device hue assume
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,M1*** from table with 361 entries for ***H*ai0*** from 0 to 360 degrees
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (8)

For any input or output device (m=0 to 1) it is valid for constant ***n*, *c*, *l*, *H*a***:
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (9)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (10)
Adated CIELAB hue: $H^*_{a1} = H^*_{a,M0} = H^*_{a,M1}$ (11)
"red, green, blue" ***rgb*1*** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (12)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: ***LCH*a1*** and ***rgb*1*** data: ***olv*31*** (13)

ZE021-7

Colorimetric data for system line NRS18 –> NLS00

For input ***LCH**a0*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH**a,M1***, ***olv**3,M1***, ***LCH**a1***, ***olv**31*** of the system 1: NLS00
Six CIELAB hue angles of device NLS00: (30.0 90.0 150.0 210.0 270.0 330.0);

	–>NRS18	–>NRS18	NLS00	NLS00	NLS00	NLS00	
no. Colour	***LCH**a0***	***n*, c*, H*ai0***	***LCH**a,M1***	***olv**3,M1***	***LCH**a1***	***olv**31***	0 1
01 *R=r00j*	52.8 38.5 25	0.3 0.5 25	34.5 91.2 25	1.0 0.0 0.08	36.3 45.6 25	0.7 0.2 0.24	
02 *r10j*	52.8 36.2 32	0.3 0.5 32	32.9 93.6 32	1.0 0.03 0.0	35.5 46.8 32	0.7 0.22 0.2	
03 *r20j*	52.8 34.4 39	0.3 0.5 39	36.6 88.5 39	1.0 0.15 0.0	37.4 44.2 39	0.7 0.28 0.2	
04 *r30j*	52.8 33.1 46	0.3 0.5 46	40.3 85.1 46	1.0 0.27 0.0	39.2 42.6 46	0.7 0.33 0.2	
05 *r40j*	52.8 32.5 52	0.3 0.5 52	43.5 83.4 52	1.0 0.37 0.0	40.8 41.7 52	0.7 0.38 0.2	
06 *r50j*	52.8 32.3 59	0.3 0.5 59	47.2 82.6 59	1.0 0.48 0.0	42.7 41.3 59	0.7 0.44 0.2	
07 *r60j*	52.8 32.6 66	0.3 0.5 66	50.9 83.1 66	1.0 0.6 0.0	44.5 41.5 66	0.7 0.5 0.2	
08 *r070j*	52.8 33.2 72	0.3 0.5 72	54.1 84.5 72	1.0 0.7 0.0	46.1 42.2 72	0.7 0.55 0.2	
09 *r80j*	52.8 34.4 79	0.3 0.5 79	57.8 87.4 79	1.0 0.82 0.0	48.0 43.7 79	0.7 0.61 0.2	
10 *r90j*	52.8 36.3 86	0.3 0.5 86	61.5 91.9 86	1.0 0.93 0.0	49.8 46.0 86	0.7 0.67 0.2	
11 *J=j00g*	52.8 38.6 92	0.3 0.5 92	62.6 93.6 92	0.97 1.0 0.0	50.4 46.8 92	0.68 0.7 0.2	

ZE020–7

Goal: Transfer coordinates ***LCH**a0*** (system m=0) to ***LCH**a1*** and ***olv**31*** (system m=1)
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,M1*** and ***olv**3,M1*** from table with 361 entries for ***H**ai0***
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (6)
"Red, Green, Blue" ***rgb*1** data:-Datei: $olv^*_{3,M1} = olv^*_{3,M1}\,[\,H^*_{ai0}\,]$ (7)

For any input or output device (m=0 to 1) it is valid for constant ***n*, c*, l*, H*a*:**
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (8)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (9)
Adated CIELAB hue: $H^*_{a1} = H^*_{a0}$ (10)
"red, green, blue" ***rgb*1** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (11)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: LCH^*_{a1} and ***rgb*1** data: olv^*_{31} (12)

ZE020–7

Colorimetric data for system line NRS18 –> NLS00

For input ***olv**30*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH**a,M1***, ***olv**3,M1***, ***LCH**a1***, ***olv**31*** of the system 1: NLS00
Six CIELAB hue angles of device NLS00: (30.0 90.0 150.0 210.0 270.0 330.0);

	–>NRS18	–>NRS18	NLS00	NLS00	NLS00	NLS00	
no. Colour	***olv**30=rgb*30n*, c*, H*si0***		***LCH**a,M1***	***olv**3,M1***	***LCH**a1***	***olv**31***	0 1
01 *R=r00j*	0.7 0.2 0.2	0.3 0.5 30	34.5 91.2 25	1.0 0.0 0.08	36.3 45.6 25	0.7 0.2 0.24	
02 *r10j*	0.7 0.25 0.2	0.3 0.5 35	32.9 93.6 32	1.0 0.03 0.0	35.5 46.8 32	0.7 0.22 0.2	
03 *r20j*	0.7 0.3 0.2	0.3 0.5 41	36.6 88.5 39	1.0 0.15 0.0	37.4 44.2 39	0.7 0.28 0.2	
04 *r30j*	0.7 0.35 0.2	0.3 0.5 47	40.3 85.1 46	1.0 0.27 0.0	39.2 42.6 46	0.7 0.33 0.2	
05 *r40j*	0.7 0.4 0.2	0.3 0.5 53	43.5 83.4 52	1.0 0.37 0.0	40.8 41.7 52	0.7 0.38 0.2	
06 *r50j*	0.7 0.45 0.2	0.3 0.5 60	47.2 82.6 59	1.0 0.48 0.0	42.7 41.3 59	0.7 0.44 0.2	
07 *r60j*	0.7 0.5 0.2	0.3 0.5 67	50.9 83.1 66	1.0 0.6 0.0	44.5 41.5 66	0.7 0.5 0.2	
08 *r070j*	0.7 0.55 0.2	0.3 0.5 73	54.1 84.5 72	1.0 0.7 0.0	46.1 42.2 72	0.7 0.55 0.2	
09 *r80j*	0.7 0.6 0.2	0.3 0.5 79	57.8 87.4 79	1.0 0.82 0.0	48.0 43.7 79	0.7 0.61 0.2	
10 *r90j*	0.7 0.65 0.2	0.3 0.5 85	61.5 91.9 86	1.0 0.93 0.0	49.8 46.0 86	0.7 0.67 0.2	
11 *J=j00g*	0.7 0.7 0.2	0.3 0.5 90	62.6 93.6 92	0.97 1.0 0.0	50.4 46.8 92	0.68 0.7 0.2	

ZE021–7

Goal: Transfer coordinates ***olv**30*** (system m=0) to ***LCH**a1*** and ***olv**31*** (system m=1)
The following equations for relative blackness and chroma are valid for any device:

$$n^* = 1 - max\,(o^*_{30}, l^*_{30}, v^*_{30}\,) \quad (1)$$
$$c^* = max\,(o^*_{30}, l^*_{30}, v^*_{30}\,) - min\,(o^*_{30}, l^*_{30}, v^*_{30}\,) \quad (2)$$

For the calculation of the missing relative device hue assume
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,M1*** from table with 361 entries for ***H**ai0*** from 0 to 360 degrees
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (8)

For any input or output device (m=0 to 1) it is valid for constant ***n*, c*, l*, H*a*:**
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (9)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (10)
Adated CIELAB hue: $H^*_{a1} = H^*_{a,M0} = H^*_{a,M1}$ (11)
"red, green, blue" ***rgb*1** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (12)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: LCH^*_{a1} and ***rgb*1** data: olv^*_{31} (13)

ZE021–7

Colorimetric data for system line NRS18 –> NRS18

For input ***LCH*a0*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH*a,M1**, ***olv*a,M1**, ***LCH*a1**, ***olv*31*** of the system 1: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);

	–>NRS18	–>NRS18	NRS18	NRS18	NRS18	NRS18	
no. Colour	***LCH*a0***	***n*, c*, H*a0***	***LCH*a,M1***	***olv*3,M1***	***LCH*a1***	***olv*31***	0 1
01 *R=r00j*	52.8 38.5 25	0.3 0.5 25	56.7 77.1 25	1.0 0.0 0.01	52.8 38.5 25	0.7 0.2 0.2	
02 *r10j*	52.8 36.2 32	0.3 0.5 32	56.7 72.4 32	1.0 0.1 0.0	52.8 36.2 32	0.7 0.25 0.2	
03 *r20j*	52.8 34.4 39	0.3 0.5 39	56.7 68.7 39	1.0 0.2 0.0	52.8 34.4 39	0.7 0.3 0.2	
04 *r30j*	52.8 33.1 46	0.3 0.5 46	56.7 66.3 46	1.0 0.31 0.0	52.8 33.1 46	0.7 0.35 0.2	
05 *r40j*	52.8 32.5 52	0.3 0.5 52	56.7 65.1 52	1.0 0.4 0.0	52.8 32.5 52	0.7 0.4 0.2	
06 *r50j*	52.8 32.3 59	0.3 0.5 59	56.7 64.6 59	1.0 0.5 0.0	52.8 32.3 59	0.7 0.45 0.2	
07 *r60j*	52.8 32.6 66	0.3 0.5 66	56.7 65.1 66	1.0 0.61 0.0	52.8 32.6 66	0.7 0.5 0.2	
08 *r070j*	52.8 33.2 72	0.3 0.5 72	56.7 66.3 72	1.0 0.7 0.0	52.8 33.2 72	0.7 0.55 0.2	
09 *r80j*	52.8 34.4 79	0.3 0.5 79	56.7 68.8 79	1.0 0.8 0.0	52.8 34.4 79	0.7 0.6 0.2	
10 *r90j*	52.8 36.3 86	0.3 0.5 86	56.7 72.6 86	1.0 0.91 0.0	52.8 36.3 86	0.7 0.65 0.2	
11 *J=j00g*	52.8 38.6 92	0.3 0.5 92	56.7 77.1 92	1.0 1.0 0.0	52.8 38.6 92	0.7 0.7 0.2	

ZE020–7

Goal: Transfer coordinates ***LCH*a0*** (system m=0) to ***LCH*a1*** and ***olv*31*** (system m=1)
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,M1*** and ***olv*3,M1*** from table with 361 entries for ***H*ai0***
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (6)
"Red, Green, Blue" ***rgb*1*** data:-Datum $olv^*_{3,M1} = olv^*_{3,M1}\,[\,H^*_{ai0}\,]$ (7)

For any input or output device (m=0 to 1) it is valid for constant ***n*, c*, l*, H*a***:
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (8)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (9)
Adated CIELAB hue: $H^*_{a1} = H^*_{a0}$ (10)
"red, green, blue" ***rgb*1*** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (11)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: ***LCH*a1*** and ***rgb*1*** data: ***olv*31*** (12)

Colorimetric data for system line NRS18 –> NRS18

For input ***olv*30*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH*a,M1**, ***olv*3,M1**, ***LCH*a1**, ***olv*31*** of the system 1: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);

	–>NRS18	–>NRS18	NRS18	NRS18	NRS18	NRS18	
no. Colour	***olv*30=rgb*30n*, c*, H*si0***		***LCH*a,M1***	***olv*3,M1***	***LCH*a1***	***olv*31***	0 1
01 *R=r00j*	0.7 0.2 0.2	0.3 0.5 30	56.7 77.1 25	1.0 0.0 0.01	52.8 38.5 25	0.7 0.2 0.2	
02 *r10j*	0.7 0.25 0.2	0.3 0.5 35	56.7 72.4 32	1.0 0.1 0.0	52.8 36.2 32	0.7 0.25 0.2	
03 *r20j*	0.7 0.3 0.2	0.3 0.5 41	56.7 68.7 39	1.0 0.2 0.0	52.8 34.4 39	0.7 0.3 0.2	
04 *r30j*	0.7 0.35 0.2	0.3 0.5 47	56.7 66.3 46	1.0 0.31 0.0	52.8 33.1 46	0.7 0.35 0.2	
05 *r40j*	0.7 0.4 0.2	0.3 0.5 53	56.7 65.1 52	1.0 0.4 0.0	52.8 32.5 52	0.7 0.4 0.2	
06 *r50j*	0.7 0.45 0.2	0.3 0.5 60	56.7 64.6 59	1.0 0.5 0.0	52.8 32.3 59	0.7 0.45 0.2	
07 *r60j*	0.7 0.5 0.2	0.3 0.5 67	56.7 65.1 66	1.0 0.61 0.0	52.8 32.6 66	0.7 0.5 0.2	
08 *r070j*	0.7 0.55 0.2	0.3 0.5 73	56.7 66.3 72	1.0 0.7 0.0	52.8 33.2 72	0.7 0.55 0.2	
09 *r80j*	0.7 0.6 0.2	0.3 0.5 79	56.7 68.8 79	1.0 0.8 0.0	52.8 34.4 79	0.7 0.6 0.2	
10 *r90j*	0.7 0.65 0.2	0.3 0.5 85	56.7 72.6 86	1.0 0.91 0.0	52.8 36.3 86	0.7 0.65 0.2	
11 *J=j00g*	0.7 0.7 0.2	0.3 0.5 90	56.7 77.1 92	1.0 1.0 0.0	52.8 38.6 92	0.7 0.7 0.2	

ZE021–7

Goal: Transfer coordinates ***olv*30*** (system m=0) to ***LCH*a1*** and ***olv*31*** (system m=1)
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 assume
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,M1*** from table with 361 entries for ***H*ai0*** from 0 to 360 degrees
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (8)

For any input or output device (m=0 to 1) it is valid for constant ***n*, c*, l*, H*a***:
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (9)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (10)
Adated CIELAB hue: $H^*_{a1} = H^*_{a,M0} = H^*_{a,M1}$ (11)
"red, green, blue" ***rgb*1*** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (12)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: ***LCH*a1*** and ***rgb*1*** data: ***olv*31*** (13)

Colorimetric data for system line NRS18 –> SRS18

For input ***LCH*a0*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH*a,M1***, ***olv*a,M1***, ***LCH*a1***, ***olv*31*** of the system 1: SRS18
Six CIELAB hue angles of device SRS18: (30.0 90.0 150.0 210.0 270.0 330.0);

	–>NRS18	–>NRS18	SRS18	SRS18	SRS18	SRS18	SRS18	
no. Colour	***LCH*a0***	*n*, c*, H*a0*	***LCH*a,M1***	***olv*3,M1***	***LCH*a1***	***LCH*a,M1***	***olv*31***	0 1
01 *R=r00j*	52.8 38.5 25	0.3 0.5 25	56.7 74.0 25	1.0 0.0 0.08	52.8 37.0 25	0.7 0.2 0.24		
02 *r10j*	52.8 36.2 32	0.3 0.5 32	56.7 75.9 32	1.0 0.03 0.0	52.8 38.0 32	0.7 0.22 0.2		
03 *r20j*	52.8 34.4 39	0.3 0.5 39	56.7 71.8 39	1.0 0.15 0.0	52.8 35.9 39	0.7 0.27 0.2		
04 *r30j*	52.8 33.1 46	0.3 0.5 46	56.7 69.1 46	1.0 0.27 0.0	52.8 34.5 46	0.7 0.33 0.2		
05 *r40j*	52.8 32.5 52	0.3 0.5 52	56.7 67.7 52	1.0 0.37 0.0	52.8 33.8 52	0.7 0.38 0.2		
06 *r50j*	52.8 32.3 59	0.3 0.5 59	56.7 67.0 59	1.0 0.48 0.0	52.8 33.5 59	0.7 0.44 0.2		
07 *r60j*	52.8 32.6 66	0.3 0.5 66	56.7 67.4 66	1.0 0.6 0.0	52.8 33.7 66	0.7 0.5 0.2		
08 *r070j*	52.8 33.2 72	0.3 0.5 72	56.7 68.5 72	1.0 0.7 0.0	52.8 34.3 72	0.7 0.55 0.2		
09 *r80j*	52.8 34.4 79	0.3 0.5 79	56.7 70.9 79	1.0 0.82 0.0	52.8 35.4 79	0.7 0.61 0.2		
10 *r90j*	52.8 36.3 86	0.3 0.5 86	56.7 74.6 86	1.0 0.93 0.0	52.8 37.3 86	0.7 0.67 0.2		
11 *J=j00g*	52.8 38.6 92	0.3 0.5 92	56.7 75.9 92	0.97 1.0 0.0	52.8 38.0 92	0.68 0.7 0.2		

Goal: Transfer coordinates ***LCH*a0*** (system m=0) to ***LCH*a1*** and ***olv*31*** (system m=1)
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,M1*** and ***olv*3,M1*** from table with 361 entries for ***H*ai0***
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (6)
"Red, Green, Blue" ***rgb*1*** data:-Datum $olv^*_{3,M1} = olv^*_{3,M1}\,[\,H^*_{ai0}\,]$ (7)

For any input or output device (m=0 to 1) it is valid for constant ***n*, c*, l*, H*a***:
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (8)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (9)
Adated CIELAB hue: $H^*_{a1} = H^*_{a0}$ (10)
"red, green, blue" ***rgb*1*** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (11)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: ***LCH*a1*** and ***rgb*1*** data: ***olv*31*** (12)

ZE020–7

Colorimetric data for system line NRS18 –> SRS18

For input ***olv*30*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH*a,M1***, ***olv*3,M1***, ***LCH*a1***, ***olv*31*** of the system 1: SRS18
Six CIELAB hue angles of device SRS18: (30.0 90.0 150.0 210.0 270.0 330.0);

	–>NRS18	–>NRS18	SRS18	SRS18	SRS18	SRS18	SRS18	
no. Colour	***olv*30=rgb*30 n*, c*, H*si0***		***LCH*a,M1***	***olv*3,M1***	***LCH*a1***	***LCH*a,M1***	***olv*31***	0 1
01 *R=r00j*	0.7 0.2 0.2	0.3 0.5 30	56.7 74.0 25	1.0 0.0 0.08	52.8 37.0 25	0.7 0.2 0.24		
02 *r10j*	0.7 0.25 0.2	0.3 0.5 35	56.7 75.9 32	1.0 0.03 0.0	52.8 38.0 32	0.7 0.22 0.2		
03 *r20j*	0.7 0.3 0.2	0.3 0.5 41	56.7 71.8 39	1.0 0.15 0.0	52.8 35.9 39	0.7 0.27 0.2		
04 *r30j*	0.7 0.35 0.2	0.3 0.5 47	56.7 69.1 46	1.0 0.27 0.0	52.8 34.5 46	0.7 0.33 0.2		
05 *r40j*	0.7 0.4 0.2	0.3 0.5 53	56.7 67.7 52	1.0 0.37 0.0	52.8 33.8 52	0.7 0.38 0.2		
06 *r50j*	0.7 0.45 0.2	0.3 0.5 60	56.7 67.0 59	1.0 0.48 0.0	52.8 33.5 59	0.7 0.44 0.2		
07 *r60j*	0.7 0.5 0.2	0.3 0.5 67	56.7 67.4 66	1.0 0.6 0.0	52.8 33.7 66	0.7 0.5 0.2		
08 *r070j*	0.7 0.55 0.2	0.3 0.5 73	56.7 68.5 72	1.0 0.7 0.0	52.8 34.3 72	0.7 0.55 0.2		
09 *r80j*	0.7 0.6 0.2	0.3 0.5 79	56.7 70.9 79	1.0 0.82 0.0	52.8 35.4 79	0.7 0.61 0.2		
10 *r90j*	0.7 0.65 0.2	0.3 0.5 85	56.7 74.6 86	1.0 0.93 0.0	52.8 37.3 86	0.7 0.67 0.2		
11 *J=j00g*	0.7 0.7 0.2	0.3 0.5 90	56.7 75.9 92	0.97 1.0 0.0	52.8 38.0 92	0.68 0.7 0.2		

Goal: Transfer coordinates ***olv*30*** (system m=0) to ***LCH*a1*** and ***olv*31*** (system m=1)
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 assume
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,M1*** from table with 361 entries for ***H*ai0*** from 0 to 360 degrees
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (8)

For any input or output device (m=0 to 1) it is valid for constant ***n*, c*, l*, H*a***:
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (9)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (10)
Adated CIELAB hue: $H^*_{a1} = H^*_{a,M0} = H^*_{a,M1}$ (11)
"red, green, blue" ***rgb*1*** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (12)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: ***LCH*a1*** and ***rgb*1*** data: ***olv*31*** (13)

ZE021–7

Colorimetric data for system line NRS18 –> TLS70

For input ***LCH*a0*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH*a,M1***, ***olv*3,M1***, ***LCH*a1***, ***olv*31*** of the system 1: TLS70
Six CIELAB hue angles of device TLS70: (21.9 107.3 142.3 197.9 293.9 326.1);

	–>NRS18		–>NRS18		TLS70		TLS70		TLS70		TLS70		
no.	*Colour*	***LCH*a0***		***n*, c*, H*ai0***		***LCH*a,M1***		***olv*3,M1***		***LCH*a1***		***olv*31***	0 1
01	*R=r00j*	52.8	38.5	25	0.3 0.5	77.1	27.0	25	1.0 0.04 0.0	78.5	13.5	25	0.7 0.22 0.2
02	*r10j*	52.8	36.2	32	0.3 0.5	78.5	24.7	32	1.0 0.12 0.0	79.2	12.4	32	0.7 0.26 0.2
03	*r20j*	52.8	34.4	39	0.3 0.5	79.9	23.1	39	1.0 0.2 0.0	80.0	11.5	39	0.7 0.3 0.2
04	*r30j*	52.8	33.1	46	0.3 0.5	81.4	22.0	46	1.0 0.28 0.0	80.7	11.0	46	0.7 0.34 0.2
05	*r40j*	52.8	32.5	52	0.3 0.5	82.6	21.3	52	1.0 0.35 0.0	81.3	10.7	52	0.7 0.38 0.2
06	*r50j*	52.8	32.3	59	0.3 0.5	84.0	20.9	59	1.0 0.43 0.0	82.0	10.5	59	0.7 0.42 0.2
07	*r60j*	52.8	32.6	66	0.3 0.5	85.5	20.8	66	1.0 0.52 0.0	82.7	10.4	66	0.7 0.46 0.2
08	*r070j*	52.8	33.2	72	0.3 0.5	86.7	21.0	72	1.0 0.59 0.0	83.3	10.5	72	0.7 0.49 0.2
09	*r80j*	52.8	34.4	79	0.3 0.5	88.1	21.5	79	1.0 0.67 0.0	84.1	10.7	79	0.7 0.53 0.2
10	*r90j*	52.8	36.3	86	0.3 0.5	89.6	22.4	86	1.0 0.75 0.0	84.8	11.2	86	0.7 0.58 0.2
11	*J=j00g*	52.8	38.6	92	0.3 0.5	90.8	23.4	92	1.0 0.82 0.0	85.4	11.7	92	0.7 0.61 0.2

Goal: Transfer coordinates ***LCH*a0*** (system m=0) to ***LCH*a1*** and ***olv*31*** (system m=1)
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,M1*** and ***olv*3,M1*** from table with 361 entries for ***H*ai0***
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (6)
"Red, Green, Blue" ***rgb1*** data:-Datum $olv^*_{3,M1} = olv^*_{3,M1}\,[\,H^*_{ai0}\,]$ (7)

For any input or output device (m=0 to 1) it is valid for constant ***n****, ***c****, ***l****, ***H*a*** :
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (8)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (9)
Adated CIELAB hue: $H^*_{a1} = H^*_{a0}$ (10)
"red, green, blue" ***rgb1*** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (11)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: LCH^*_{a1} and ***rgb1*** data: olv^*_{31} (12)

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Colorimetric data for system line NRS18 –> TLS70

For input ***olv*30*** of the system 0: NRS18
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
and output ***LCH*a,M1***, ***olv*3,M1***, ***LCH*a1***, ***olv*31*** of the system 1: TLS70
Six CIELAB hue angles of device TLS70: (21.9 107.3 142.3 197.9 293.9 326.1);

	–>NRS18		–>NRS18		TLS70		TLS70		TLS70		TLS70		
no.	*Colour*	***olv*30=rgb*30***, ***n*, c*, H*si0***				***LCH*a,M1***		***olv*3,M1***		***LCH*a1***		***olv*31***	0 1
01	*R=r00j*	0.7	0.2	0.2	0.3 0.5	77.1	27.0	25	1.0 0.04 0.0	78.5	13.5	25	0.7 0.22 0.2
02	*r10j*	0.7	0.25	0.2	0.3 0.5	78.5	24.7	32	1.0 0.12 0.0	79.2	12.4	32	0.7 0.26 0.2
03	*r20j*	0.7	0.3	0.2	0.3 0.5	79.9	23.1	39	1.0 0.2 0.0	80.0	11.5	39	0.7 0.3 0.2
04	*r30j*	0.7	0.35	0.2	0.3 0.5	81.4	22.0	46	1.0 0.28 0.0	80.7	11.0	46	0.7 0.34 0.2
05	*r40j*	0.7	0.4	0.2	0.3 0.5	82.6	21.3	52	1.0 0.35 0.0	81.3	10.7	52	0.7 0.38 0.2
06	*r50j*	0.7	0.45	0.2	0.3 0.5	84.0	20.9	59	1.0 0.43 0.0	82.0	10.5	59	0.7 0.42 0.2
07	*r60j*	0.7	0.5	0.2	0.3 0.5	85.5	20.8	66	1.0 0.52 0.0	82.7	10.4	66	0.7 0.46 0.2
08	*r070j*	0.7	0.55	0.2	0.3 0.5	86.7	21.0	72	1.0 0.59 0.0	83.3	10.5	72	0.7 0.49 0.2
09	*r80j*	0.7	0.6	0.2	0.3 0.5	88.1	21.5	79	1.0 0.67 0.0	84.1	10.7	79	0.7 0.53 0.2
10	*r90j*	0.7	0.65	0.2	0.3 0.5	89.6	22.4	86	1.0 0.75 0.0	84.8	11.2	86	0.7 0.58 0.2
11	*J=j00g*	0.7	0.7	0.2	0.3 0.5	90.8	23.4	92	1.0 0.82 0.0	85.4	11.7	92	0.7 0.61 0.2

Goal: Transfer coordinates ***olv*30*** (system m=0) to ***LCH*a1*** and ***olv*31*** (system m=1)
The following equations for relative blackness and chroma are valid for any device:

$$n^* = 1 - max\,(o^*_{30}, l^*_{30}, v^*_{30}\,) \quad (1)$$
$$c^* = max\,(o^*_{30}, l^*_{30}, v^*_{30}\,) - min\,(o^*_{30}, l^*_{30}, v^*_{30}\,) \quad (2)$$

For the calculation of the missing relative device hue assume
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,M1*** from table with 361 entries for ***H*ai0*** from 0 to 360 degrees
lightness, chroma, hue: $LCH^*_{a,M1} = LCH^*_{a,M1}\,[\,H^*_{ai0}\,]$ (8)

For any input or output device (m=0 to 1) it is valid for constant ***n****, ***c****, ***l****, ***H*a*** :
CIELAB lightness: $L^*_1 = L^*_{a1} = L^*_{N1} + l^*\,[\,L^*_{W1} - L^*_{N1}\,]$ (9)
Adated CIELAB chroma: $C^*_{a1} = c^*\,C^*_{a,M1}$ (10)
Adated CIELAB hue: $H^*_{a1} = H^*_{a,M0} = H^*_{a,M1}$ (11)
"red, green, blue" ***rgb1*** data: $olv^*_{31} = 1 - n^* - c^* + c^*\,olv^*_{3,M1}$ (12)

Result: device dependent adapted and relative CIELAB data of system m=1:
lightness, chroma, hue: LCH^*_{a1} and ***rgb1*** data: olv^*_{31} (13)

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