

# Showcase of the regional nesting SEI message

JCTVC-Z0033

Qualcomm, Technicolor, Philips

# Regional Nesting (RN) SEI

- RN SEI specifies rectangular regions to which one or more SEI messages apply
- Proposed in JCTVC-X0062 and JCTVC-Y0035
- Showcase of the usage requested at the last meeting

# Showcase of RN SEI

1. Tone mapping information SEI
2. Colour remapping information SEI: HDR/SDR mixed-content
3. Colour remapping information SEI: PQ2020-to-SDR709 dual-grading
4. Chroma resampling filter hint SEI

Tone mapping information SEI

Sky is saturated



# Tone Mapping applied to the sky region



Tone mapping applied to the entire frame makes it darker overall



# Colour remapping information SEI

HDR/SDR mixed content

# Balloon image looks dull

A screenshot of a Mac OS X desktop environment showing a Safari browser window displaying a hot air balloon image, a 3D surface plot, and a JCT-VC Document Management System interface. A clock overlay is visible on the right side of the JCT-VC interface.

The Safari browser window displays a hot air balloon image. The address bar shows the URL <https://phenix.int-ecv.fr/jct/>. The menu bar includes File, Edit, View, History, Bookmarks, Window, and Help. The status bar shows the date and time: Wed Oct 16 7:04:42 PM.

The 3D surface plot shows a red, wavy surface on a grid. The axes are labeled with values from 0 to 50. The plot is displayed in a window with a menu bar including File, Edit, View, Insert, Tools, Desktop, Window, and Help.

The JCT-VC Document Management System interface displays a table of documents. The table has columns for Document ID, Date, Time, and Description. The documents are listed in a table with columns for Document ID, Date, Time, and Description. The documents are listed in a table with columns for Document ID, Date, Time, and Description.

Document ID	Date	Time	Description
JCTVC-N0050	2013-07-11	20:39:28	Specification text to support AVC base layer in HEVC layered extensions
JCTVC-N0051	2013-07-11	20:39:30	MV-HEVC/SHVC HLS: Viewid and view position index
JCTVC-N0052	2013-07-12	00:15:54	RCE2 subtest C.2: Extension of residual DPCM to lossy coding
JCTVC-N0053	2013-07-12	00:19:12	RCE2 subtest C.4: Replacement of DC mode for transform-skip and transform-bypass blocks
JCTVC-N0054	2013-07-12	07:45:26	Signalling and restriction for scaled reference layer offsets
JCTVC-N0055	2013-07-12	07:45:30	On resampling process for outside-bounds samples
JCTVC-N0056	2013-07-12	07:45:32	MV-HEVC/SHVC HLS: On inter-layer reference picture output marking
JCTVC-N0057	2013-07-12	07:51:51	MV-HEVC/SHVC HLS: On inter-layer picture selection in RPS and colPic
JCTVC-N0058	2013-07-12	07:51:55	MV-HEVC/SHVC HLS: On dependency type
JCTVC-N0059	2013-07-12	07:51:59	MV-HEVC/SHVC HLS: On slice segment header extension
JCTVC-N0060	2013-07-12	07:52:03	MV-HEVC/SHVC HLS: TemporalID alignment and inter-layer prediction restriction
JCTVC-N0061	2013-07-12	10:47:34	Non-SCE3.3: Inter-layer interpolation-based SAO filtering for SHVC
JCTVC-N0062	2013-07-12	14:02:06	MV-HEVC/SHVC HLS: access unit boundary detection
JCTVC-N0063	2013-07-12	14:06:19	REXT/MV-HEVC/SHVC HLS: auxiliary picture layers
JCTVC-N0064	2013-07-12	14:12:36	MV-HEVC/SHVC HLS: on storage of motion fields
JCTVC-N0065	2013-07-12	14:15:29	MV-HEVC/SHVC HLS: On IDR picture constraints
JCTVC-N0066	2013-07-12	14:18:33	MV-HEVC/SHVC HLS: Layer-wise startup of the decoding process
JCTVC-N0067	2013-07-12	14:22:29	MV-HEVC/SHVC HLS: on associating Viewid with nuh_layer_id and camera position
JCTVC-N0068	2013-07-12	18:37:59	Inter-layer prediction modes based on base layer

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# CRI applied to the Balloon region

A screenshot of a computer desktop showing a Safari browser window displaying a large image of a hot air balloon festival. The image is being processed by a software application, likely a video encoder, as evidenced by the 3D surface plot in the bottom left corner. The plot shows a red, wavy surface, which is a visualization of the video content's spatial characteristics. The software interface includes a menu bar (File, Edit, View, Insert, Tools, Desktop, Window, Help) and a toolbar with various icons. A clock in the bottom right corner indicates the time is 10:00:00. The system status bar at the top shows the date as Wednesday, October 16, 2013, at 7:04:42 PM, and the system is running on a Mac OS X desktop.

The right side of the image shows a window titled "Welcome to JCT-VC" displaying the "JCT-VC DOCUMENT MANAGEMENT SYSTEM". The window includes a sidebar with a "User" section (Login, Create new user, Contact) and a "JCT-VC News" section (JCT-VC News, Next meeting, All meetings). The main content area is a table listing document entries, including document ID, date, title, and author. A clock icon is overlaid on the table.

Document ID	Date	Title	Author
JCTVC-N0050	2013-07-11	Specification text to support AVC base layer in HEVC layered extensions	J. Boyce (Vdyol)
JCTVC-N0051	2013-07-11	MV-HEVC/SHVC HLS: Viewid and view position index	J. Boyce (Vdyol)
JCTVC-N0052	2013-07-12	RCE2 subtest C.2: Extension of residual DPCM to lossy coding	R. Joshi (Qualcomm)
JCTVC-N0053	2013-07-12	RCE2 subtest C.4: Replacement of DC mode for transform-skip and transform-bypass blocks	R. Joshi (Qualcomm)
JCTVC-N0054	2013-07-12	Signalling and restriction for scaled reference layer offsets	T. Tsukuba, T. Yamamoto (Sharp)
JCTVC-N0055	2013-07-12	On resampling process for outside-bounds samples	T. Tsukuba, T. Yamamoto, T. Ikai (Sharp)
JCTVC-N0056	2013-07-12	MV-HEVC/SHVC HLS: On inter-layer reference picture output marking	T. Yamamoto, T. Tsukuba, T. Ikai (Sharp)
JCTVC-N0057	2013-07-12	MV-HEVC/SHVC HLS: On inter-layer picture selection in RPS and colPic	T. Ikai, T. Uchiumi (Sharp)
JCTVC-N0058	2013-07-12	MV-HEVC/SHVC HLS: On dependency type	T. Ikai, T. Uchiumi (Sharp)
JCTVC-N0059	2013-07-12	MV-HEVC/SHVC HLS: On slice segment header extension	T. Ikai, T. Uchiumi (Sharp)
JCTVC-N0060	2013-07-12	MV-HEVC/SHVC HLS: TemporalID alignment and inter-layer prediction restriction	T. Ikai, Y. Yamamoto (Sharp)
JCTVC-N0061	2013-07-12	Non-SCE3.3: Inter-layer interpolation-based SAO filtering for SHVC	A. Filippov, V. Ruffelsky (Huawei)
JCTVC-N0062	2013-07-12	MV-HEVC/SHVC HLS: access unit boundary detection	M. M. Hannuksela (Nokia)
JCTVC-N0063	2013-07-12	REXT/MV-HEVC/SHVC HLS: auxiliary picture layers	M. M. Hannuksela (Nokia)
JCTVC-N0064	2013-07-12	MV-HEVC/SHVC HLS: on storage of motion fields	M. M. Hannuksela (Nokia)
JCTVC-N0065	2013-07-12	MV-HEVC/SHVC HLS: On IDR picture constraints	M. M. Hannuksela (Nokia)
JCTVC-N0066	2013-07-12	MV-HEVC/SHVC HLS: Layer-wise startup of the decoding process	M. M. Hannuksela (Nokia)
JCTVC-N0067	2013-07-12	MV-HEVC/SHVC HLS: on associating Viewid with nuh_layer_id and camera position	M. M. Hannuksela (Nokia), L. Chen (USTC)
JCTVC-N0068	2013-07-12	Inter-layer prediction modes based on base layer	Maxim Sychev, Valery

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# CRI applied to the entire frame

The screenshot displays a computer desktop environment. The top menu bar shows 'Safari' with options: File, Edit, View, History, Bookmarks, Window, Help. The status bar at the bottom indicates system information: CPU: 16%, RAM: 28%, and the date/time: Wed Oct 16 7:04:42 PM.

The main window is a Safari browser displaying a large image of hot air balloons over a field. Below the image is a 3D surface plot with axes ranging from -10 to 40. To the right of the plot is a table with columns for document ID, date, and other metadata. The table contains entries for documents JCTVC-N0050 through JCTVC-N0088.

Overlaid on the right side of the desktop is a window titled 'Welcome to JCT-VC' and 'JCT-VC DOCUMENT MANAGEMENT SYSTEM'. It features a table with columns for document ID, date, and a list of authors. The table includes entries for documents JCTVC-N0050 through JCTVC-N0088. A clock overlay is visible on the right side of this window.

The desktop also shows a dock at the bottom with various application icons, including a calendar, a clock, and several utility tools.

# Colour remapping information SEI

PQ2020-to-SDR709 dual-grading case

Market – PQ2020 version



Source SDR Rec. 709 with region indication



# Market - comparisons



Regional CRI



Reference SDR



Global CRI

Hue shift

**Zombie – PQ2020 version**





Source SDR Rec. 709 with region indication

# Zombie - comparisons



Regional CRI



Reference SDR



Global CRI

Desaturation

Hue shift  
(reddish beige)





# StEM - comparisons



Regional CRI



Reference SDR



Global CRI

Fuzzy  
incandescence

Chroma resampling filter hint SEI

# Performance of resampling filters depends on the region

Bicubic filter 4.5 dB better than box filter

Box filter 0.5 dB better than bicubic filter

QuickTime Player File Edit View Window Help

phenix.int-evry.fr/jct/

Welcome to JCT-VC

JCT-VC DOCUMENT MANAGEMENT SYSTEM

Meeting Organizer's web site Register Document Input document Template Input common JCT-VC/JCT-3V document Template

Search document

Title

Author

Search

Clear Search

Geneva Meeting - Document Register

JCT-VC number	MPEG number	Created	First upload	Last upload	Title	Source	Download
JCTVC-00005	m31065	2013-10-15 14:09:41			JCT-VC AHG report: HEVC range extensions development (AHG5)	M. Naccari, C. Rosewarne	
JCTVC-00010	m30908	2013-10-14 18:33:31			JCT-VC AHG report: SHVC core experiments (AHG10)	X. Li, J. Boyce, P. Onno, X. Xiu	
JCTVC-00012	m30970	2013-10-14 23:20:56			JCT-VC AHG report: SHVC software development (AHG12)	V. Seragiu, Y. He, T.-D. Chuang, D.-K. Kwon	
JCTVC-00032	m30940	2013-10-14 20:29:56			SCE2 Summary Report	Mathias Wien, Krishna Rapaka, Xiaoyu Xiu	
JCTVC-00036	m31066	2013-10-15 14:12:54			RCE2: Summary report on HEVC Range Extensions Core Experiment 2 (RCE2) on Rice parameter initialisation and update methods	C. Rosewarne, J. Solo, K. Shaman, S.-H. Kim	
JCTVC-00037	m30942	2013-10-14 20:33:40			RCE3: Summary report of HEVC Range Extensions Core Experiment 3 on Intra Prediction techniques	A. Saxena, D. Kwon, M. Naccari, C. Pang	
JCTVC-00041	m30749	2013-09-19 14:48:30	2013-09-19 15:00:02	2013-09-19 15:00:02	REXT/MV-HEVC/SHVC HLS: auxiliary picture layers	M. M. Hannuksela (Nokia)	JCTVC-00041
JCTVC-00042	m30751	2013-09-27 22:34:38			Proposed Editorial Improvements to High efficiency video coding (HEVC) Range Extensions Text Specification Draft 4	D. Flynn	
JCTVC-00043	m30752	2013-09-27 22:36:25	2013-10-15 01:41:28	2013-10-15 01:41:28	Best-effort decoding of 10-bit sequences	D. Flynn	JCTVC-00043
JCTVC-00044	m30753	2013-09-27 22:37:42	2013-10-15 06:32:45	2013-10-15 06:32:45	RExt: CU-adaptive chroma QP offsets	D. Flynn, N. Nguyen, D. He, G. Martin-Cocher (BlackBerry), atourapis@apple.com, G. Cola, D. Singer (Apple)	JCTVC-00044
JCTVC-00045	m30754	2013-09-27 22:39:52	2013-10-15 06:32:59	2013-10-15 06:32:59	RExt: minimum chroma TU size restriction for low-fidelity coding mode	D. Flynn, N. Nguyen, D. He (BlackBerry)	
JCTVC-00046	m30756	2013-10-03 17:09:39	2013-10-03 17:18:55	2013-10-03 17:18:55	AHG5 and AHG18: Entropy Coding Throughput for High Bit Depths	K. Sharmar, N. Saunders, J. Gamel (Sony)	
JCTVC-00047	m30757	2013-10-07 05:26:31	2013-10-14 23:42:44	2013-10-14 23:42:44	RCE 3: On sample adaptive intra prediction for oblique modes in lossless coding	H. Chen, A. Saxena, F. Fernandes (Samsung)	
JCTVC-00048	m30758	2013-10-07 05:27:28	2013-10-16 00:13:33	2013-10-16 00:13:33	RCE 3: On sample adaptive intra prediction for oblique modes in lossy coding	A. Saxena, H. Chen, F. Fernandes (Samsung)	
JCTVC-00049	m30759	2013-10-07 05:28:38	2013-10-15 05:53:08	2013-10-15 05:53:08	RCE 3: Nearest-neighbor intra prediction for screen content video coding	H. Chen, A. Saxena, F. Fernandes (Samsung)	
JCTVC-00050	m30760	2013-10-07 05:29:30			RCE 3: Cross-Check of Tool A.1 from Fujitsu	A. Saxena, F. Fernandes (Samsung)	
JCTVC-00051	m30761	2013-10-07 07:21:06	2013-10-15 23:49:35	2013-10-15 23:49:35	RCE 3: Combination of sample adaptive prediction and nearest neighbor prediction for oblique modes	A. Saxena, H. Chen, F. Fernandes (Samsung)	JCTVC-00051
JCTVC-00052	m30764	2013-10-10 01:33:37	2013-10-10 06:49:09	2013-10-10 06:49:09	SCE1: Results of Test 1.2 on selection of fixed filters for upsampling	K. Minoo, D. Baylon (ARRIS)	JCTVC-00052
JCTVC-00053	m30766	2013-10-10 06:05:29	2013-10-15 06:43:15	2013-10-15 06:43:15	RExt: On transform selection for Intra-BlockCopy blocks	A. Saxena, E. Alshina, F. Fernandes (Samsung)	JCTVC-00053
JCTVC-00054	m30775	2013-10-11 02:17:37	2013-10-15 05:04:07	2013-10-15 05:04:07	Editors' proposed corrections to HEVC version 1	Y.-K. Wang, G. J. Sullivan, B. Bross	JCTVC-00054
JCTVC-00055	m30776	2013-10-11 10:01:24	2013-10-11 10:41:14	2013-10-11 10:41:14	MV-HEVC/SHVC HLS: Skipped slice and use case	T. Yamamoto, T. Ikai, T. Tsukuba (Sharp)	JCTVC-00055
JCTVC-00056	m30777	2013-10-11 10:01:27	2013-10-11 10:44:13	2013-10-11 10:44:13	MV-HEVC/SHVC HLS: On conversion to ROI-capable multi-layer platform	T. Yamamoto, T. Ikai, T. Tsukuba (Sharp)	JCTVC-00056
JCTVC-00057	m30778	2013-10-11 10:01:29	2013-10-15 03:34:24	2013-10-15 03:34:24	MV-HEVC/SHVC HLS: On support of different luma CTB sizes for different layers	T. Yamamoto, T. Ikai, T. Tsukuba (Sharp)	JCTVC-00057
JCTVC-00058	m30779	2013-10-11 10:01:33	2013-10-15 09:15:53	2013-10-15 08:13:30	MV-HEVC/SHVC HLS: On profile, tier, and level information	T. Tsukuba, T. Ikai, T. Yamamoto (Sharp)	JCTVC-00058

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# Conclusions

- Proposed RN SEI is a simple design to specify rectangular regions to which SEI messages apply
- Requested examples RN SEI use cases have been provided
  - Video sequences of the examples are available
- Propose to adopt RN SEI in HEVC

# Showcase of the regional nesting SEI message

JCTVC-Z0033

Qualcomm, Technicolor, Philips