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CODING OF MOVING PICTURES AND AUDIO

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Abstract

This document provides the generated ISO/IEC 23090-12 Immersive Video (MIV) anchors based on the Common Test Conditions for Immersive Video and with use of the Test Model 6 of Immersive Video (TMIV) reference software 6.0.1. The crosscheck was successful.

M54856_v2:

- corrected IV-PSNR values for SE_A97, generated by Philips, crosschecked by PUT.

1 Introduction

The *Common Test Conditions for Immersive Video* (CTC) document [N19484] specifies two anchors:

- MIV anchor (A), tested in:
  - A97: full frame configuration with 97 coded frames,
  - A17: reduced frame configuration with 17 coded frames,
- MIV view anchor (V), tested in:
  - V17: reduced frame configuration.

Both anchors are based on *Test Model 6 of Immersive Video* (TMIV) reference software 6.0.1 [N19483] and *HEVC Test Model* (HM) 16.16.

2 Anchor generation and crosschecking

This document is a collaborative effort of 6 organizations: Poznań University of Technology, Tencent, Philips Research Eindhoven, Electronics and Telecommunications Research Institute, Intel and Nokia.

Table 1. Workload division.

Organization	Compiler	Sequences	
		Generated	Crosschecked
PUT	VC15	SR, SP, ST	SB, SJ, SD

Tencent	VC16	SE, SL	–
Philips	GCC 9.1.0	SA, SO	SC, SN, SQ
ETRI	VC15	SJ, SD, SU	SR, SP, ST
Intel	VC15	SB	SE, SL, SU
Nokia	GCC 9.2.0	SC, SN, SQ	SA, SO

3 Results

A selection of pose trace videos is available on the MPEG content server at /MPEG-I/Part12-ImmersiveVideo/Anchor_TMIV6.

The CTC reporting templates are attached to this document:

- anchor_A17.xlsm
- anchor_A97.xlsm
- anchor_V17.xlsm

4 A17 vs. V17

Table 2. Objective results: A17 vs. V17 (green: A17 is better).

Mandatory content - Proposal vs. Low/High-bitrate Anchors

Sequence		High-BR BD rate Y-PSNR	Low-BR BD rate Y-PSNR	Max delta Y-PSNR	High-BR BD rate VMAF	Low-BR BD rate VMAF	High-BR BD rate IV-PSNR	Low-BR BD rate IV-PSNR
ClassroomVideo	SA	-43.8%	-18.0%	0.00	---	-19.5%	-34.1%	-13.3%
Museum	SB	-64.0%	-48.7%	0.00	-27.8%	-18.5%	-73.6%	-54.6%
Hijack	SC	---	-23.8%	9.84	-18.8%	27.4%	---	-28.1%
Chess	SN	---	---	15.38	-70.7%	-19.8%	---	---
Kitchen	SJ	-36.2%	-17.6%	16.71	39.9%	20.8%	-69.7%	-42.6%
Painter	SD	34.7%	37.1%	7.92	15.1%	28.0%	9.4%	23.0%
Frog	SE	36.2%	35.3%	7.08	34.3%	34.7%	7.8%	19.6%
Carpark	SP	5.9%	19.0%	7.66	63.1%	47.1%	-12.0%	6.4%
MIV		**---**	**---**	**0.00**	**---**	**12.5%**	**---**	**---**

Optional content - Proposal vs. Low/High-bitrate Anchors

Fencing	SL	---	155.8%	13.00	109.0%	70.5%	23.1%	33.7%
Hall	ST	---	-62.4%	12.20	-14.1%	12.2%	---	-36.4%
Street	SU	235.6%	72.1%	11.08	79.0%	37.5%	9.2%	8.2%
Group	SR	87.1%	78.3%	12.10	54.3%	61.8%	14.5%	29.1%
Fan	SO	73.9%	55.4%	0.00	34.1%	28.4%	22.3%	17.7%
ChessPieces	SQ	---	---	15.82	---	-26.9%	---	---
MIV		**---**	**---**	**0.00**	**---**	**30.6%**	**---**	**---**

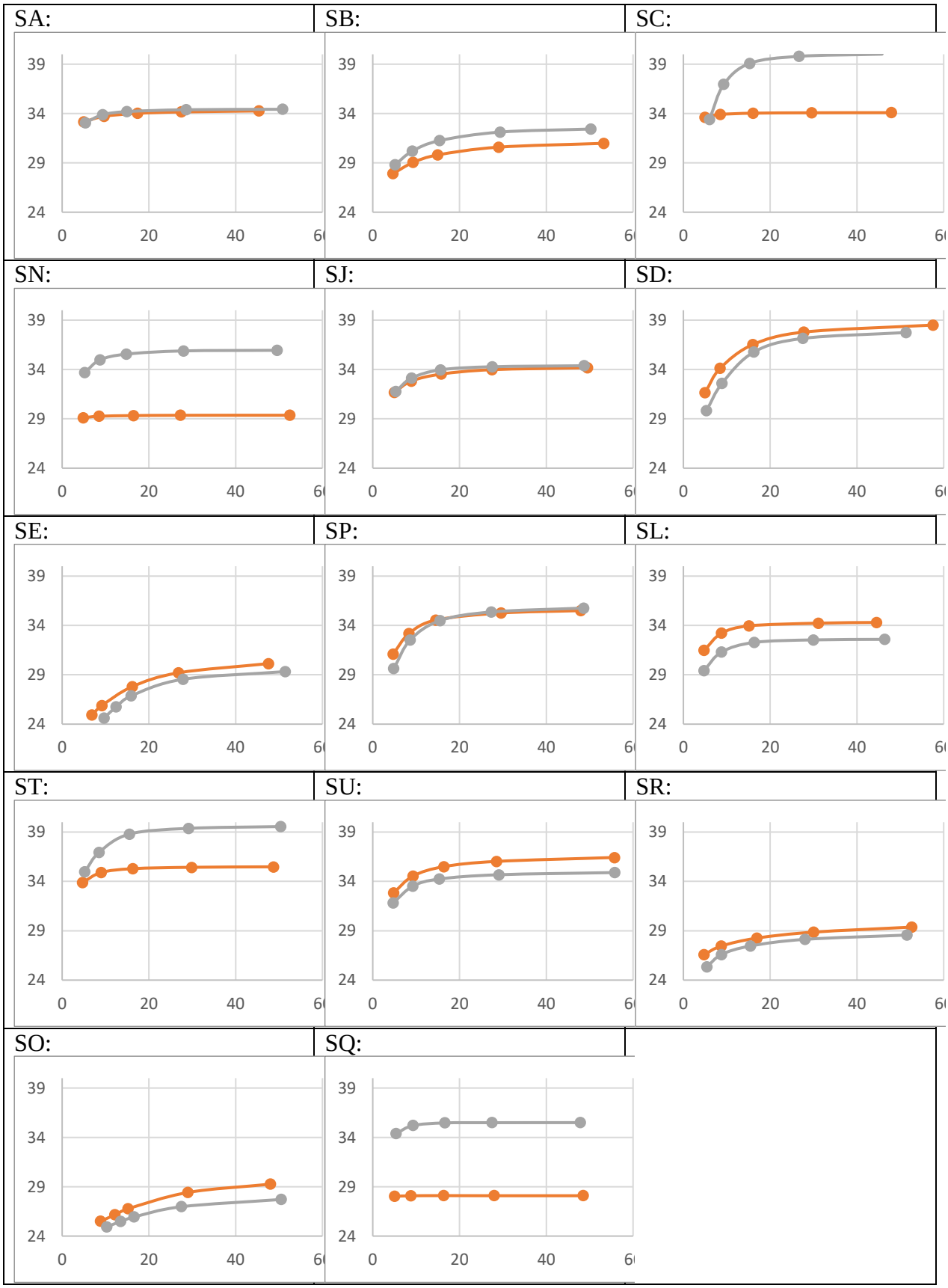

Fig. 1. WS-PSNR RD-curves: A17 (gray) vs. V17 (orange) anchor.

5 TMIV6 vs. TMIV5

When compared to previous version, TMIV6 is significantly better, both for MIV anchor (A17) and MIV view anchor (V17). It should be also noted, that V17 anchor meets all the constrains, in contrary to V17 anchor generated using TMIV5.

Table 3. Objective results: TMIV6 vs. TMIV5, anchor A17 (green: TMIV6 is better).

Mandatory content - Proposal vs. Low/High-bitrate Anchors

Sequence		High-BR BD rate Y-PSNR	Low-BR BD rate Y-PSNR	Max delta Y-PSNR	High-BR BD rate VMAF	Low-BR BD rate VMAF	High-BR BD rate IV-PSNR	Low-BR BD rate IV-PSNR
ClassroomVideo	SA	13.1%	12.8%	1.63	11.5%	19.5%	8.5%	14.2%
Museum	SB	-26.1%	-16.5%	16.05	-19.7%	-9.6%	-2.6%	2.3%
Hijack	SC	-45.0%	-7.7%	9.84	-6.0%	10.7%	-34.3%	-2.6%
Chess	SN	---	---	15.38	---	---	---	---
Kitchen	SJ	---	-28.4%	16.71	-5.3%	19.8%	---	-28.7%
Painter	SD	-32.5%	-28.0%	7.92	-44.9%	-36.7%	-29.9%	-28.0%
Frog	SE	-35.2%	-10.7%	7.08	-16.8%	19.8%	-35.1%	-5.9%
Carpark	SP	---	-44.2%	7.66	-56.5%	-35.0%	-33.7%	-22.5%
MIV		**---**	**---**	**10.28**	**---**	**---**	**---**	**---**

Optional content - Proposal vs. Low/High-bitrate Anchors

Fencing	SL	---	---	13.00	---	-45.4%	---	-48.0%
Hall	ST	---	---	12.20	-37.4%	-21.3%	---	-69.1%
Street	SU	---	---	11.08	---	-43.6%	-37.7%	-24.2%
MIV		**---**	**---**	**12.10**	**---**	**-36.8%**	**---**	**-47.1%**

Table 4. Objective results: TMIV6 vs. TMIV5, anchor V17 (green: TMIV6 is better).

Mandatory content - Proposal vs. Low/High-bitrate Anchors

Sequence		High-BR BD rate Y-PSNR	Low-BR BD rate Y-PSNR	Max delta Y-PSNR	High-BR BD rate VMAF	Low-BR BD rate VMAF	High-BR BD rate IV-PSNR	Low-BR BD rate IV-PSNR
ClassroomVideo	SA	-15.9%	-56.2%	1.88	---	-57.9%	-71.2%	-75.0%
Museum	SB	---	10.5%	15.61	-4.4%	-32.1%	64.3%	-8.1%
Hijack	SC	---	---	16.72	-9.7%	-38.6%	---	---
Chess	SN	---	282.7%	23.60	-60.6%	-53.4%	---	388.7%
Kitchen	SJ	-10.2%	-20.3%	14.76	-21.0%	-26.7%	-21.1%	-28.1%
Painter	SD	-51.8%	-55.5%	8.06	-58.1%	-58.8%	-53.7%	-57.1%
Frog	SE	-34.5%	-29.7%	6.12	-18.4%	-22.7%	-26.3%	-27.4%
Carpark	SP	-66.2%	-52.6%	10.18	-65.8%	-53.4%	-58.2%	-49.7%
MIV		**---**	**---**	**12.12**	**---**	**-42.9%**	**---**	**---**

Optional content - Proposal vs. Low/High-bitrate Anchors

Fencing	SL	---	-61.8%	12.35	-58.4%	-45.7%	-55.3%	-45.5%
Hall	ST	---	---	17.96	-62.4%	-48.5%	---	-68.2%
Street	SU	-54.8%	-46.3%	8.94	-58.4%	-48.8%	-46.2%	-43.8%
MIV		**---**	**---**	**13.08**	**-59.7%**	**-47.7%**	**---**	**-52.5%**

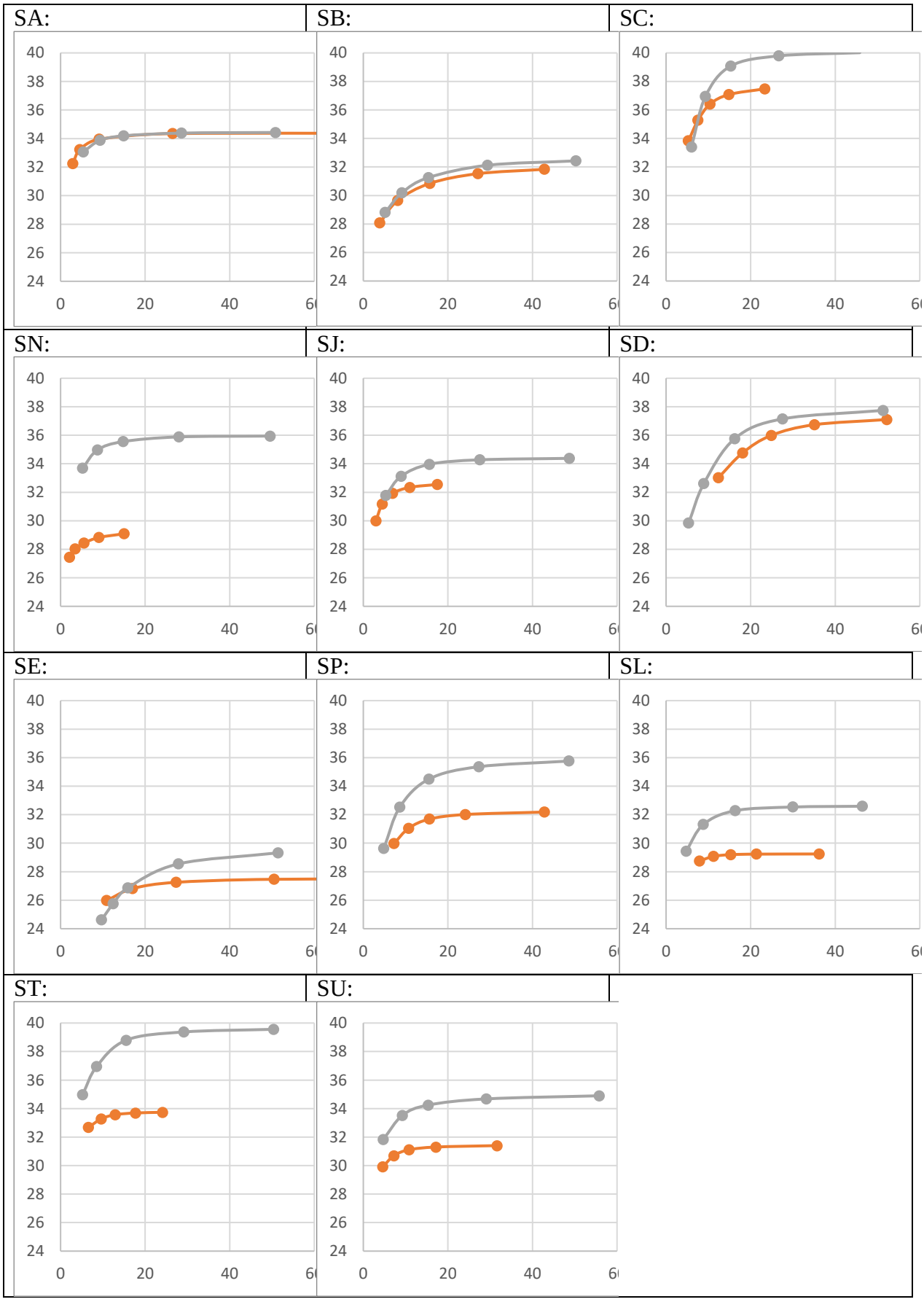

Fig. 2. WS-PSNR RD-curves: TMIV6 (gray) vs. TMIV5 (orange), anchor A17.

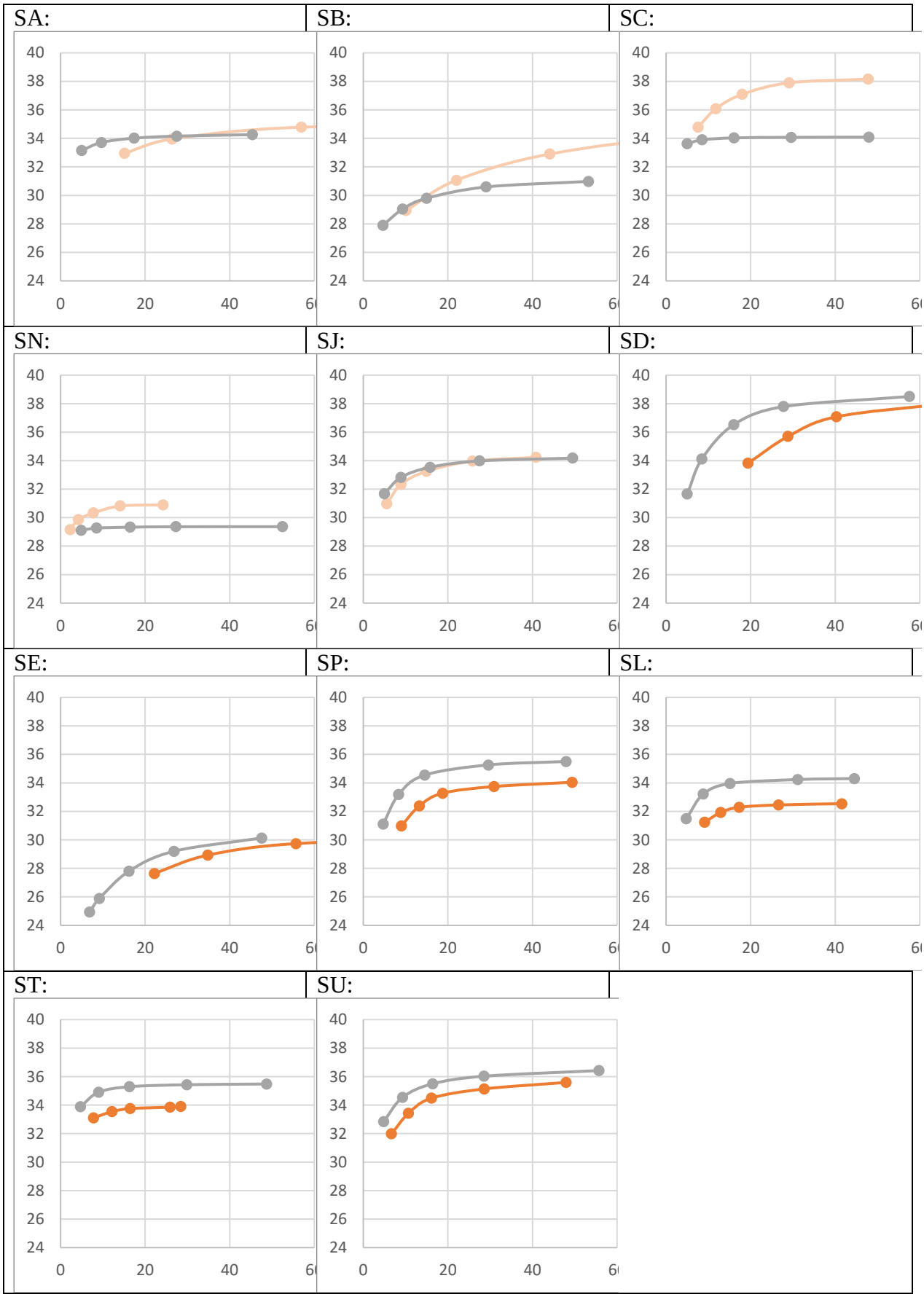

Fig. 3. WS-PSNR RD-curves: TMIV6 (gray) vs. TMIV5 (orange), anchor V17;
Note: for SA, SB, SC, SN and SJ the TMIV5 V17 anchor exceeded the pixel rate constrain.

6 Recommendations

We recommend using attached reporting templates for all proposals.