



m17913:

**Comparison of multiview compression
performance using MPEG-4 MVC and
prospective HVC technology**

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New single view coder

- As a result of recent works on High Efficiency Video Coding (HEVC) standard, a new coding standard is about to emerge
- Coding gains are up to **30%** compared to previous standard – MPEG-4 AVC
- It is therefore doubtful whether the new 3D video coding standard should be backward compatible with MPEG-4 MVC standard, which is basically an annex to MPEG-4 AVC standard.



Multiview coders

- Comparison of two compression technology:
 - MPEG-4 MVC standard codec – JMVC 6.0
 - Design for multiview sequences
 - Inter view prediction exists
 - prospective HEVC technology - Samsung proposal
 - Design for single view
 - No inter view prediction exists
 - Used in simulcast mode



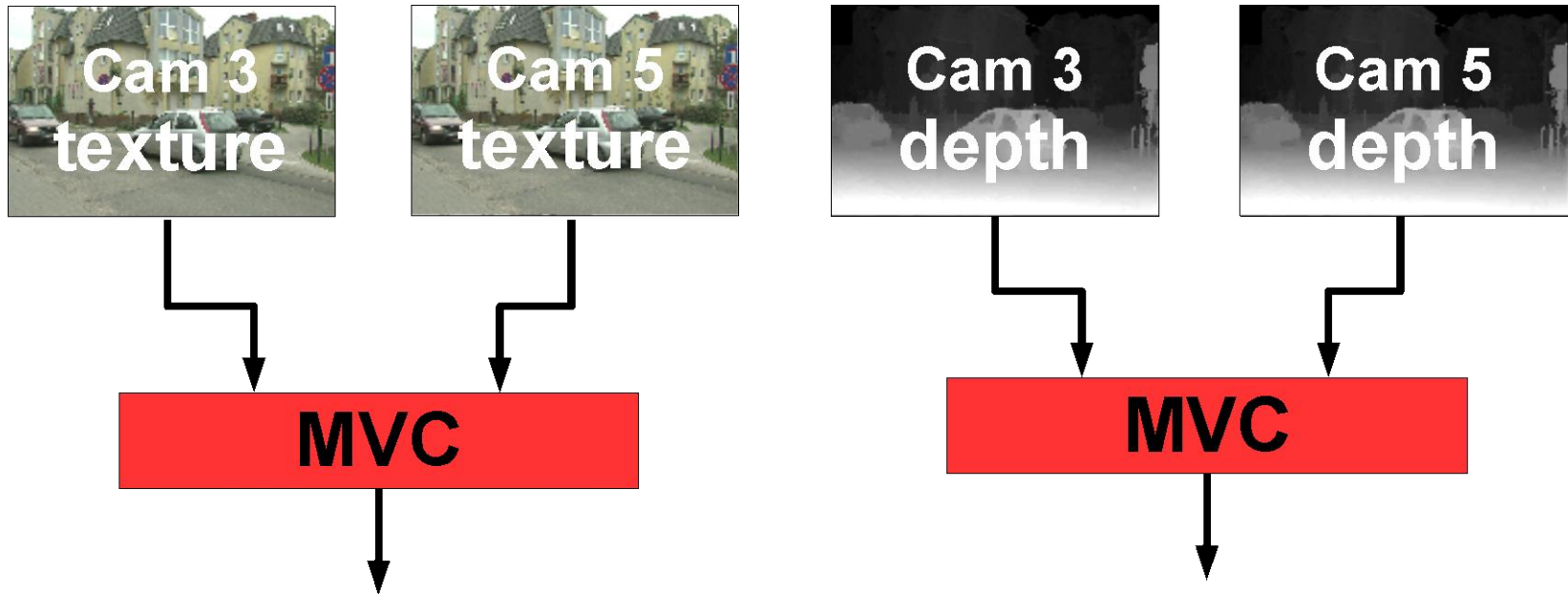
Two view case

- View 3 and 5 was used
- Both Texture and Depth was coded
- Texture and Depth was treated separately
- Parameters
 - QP Texture: 25 28 32 35
 - QD Depth: 25 28 32 35
 - GOP – 16
 - Full HD sequence – Poznan Street - 200 frames



MPEG-4 MVC

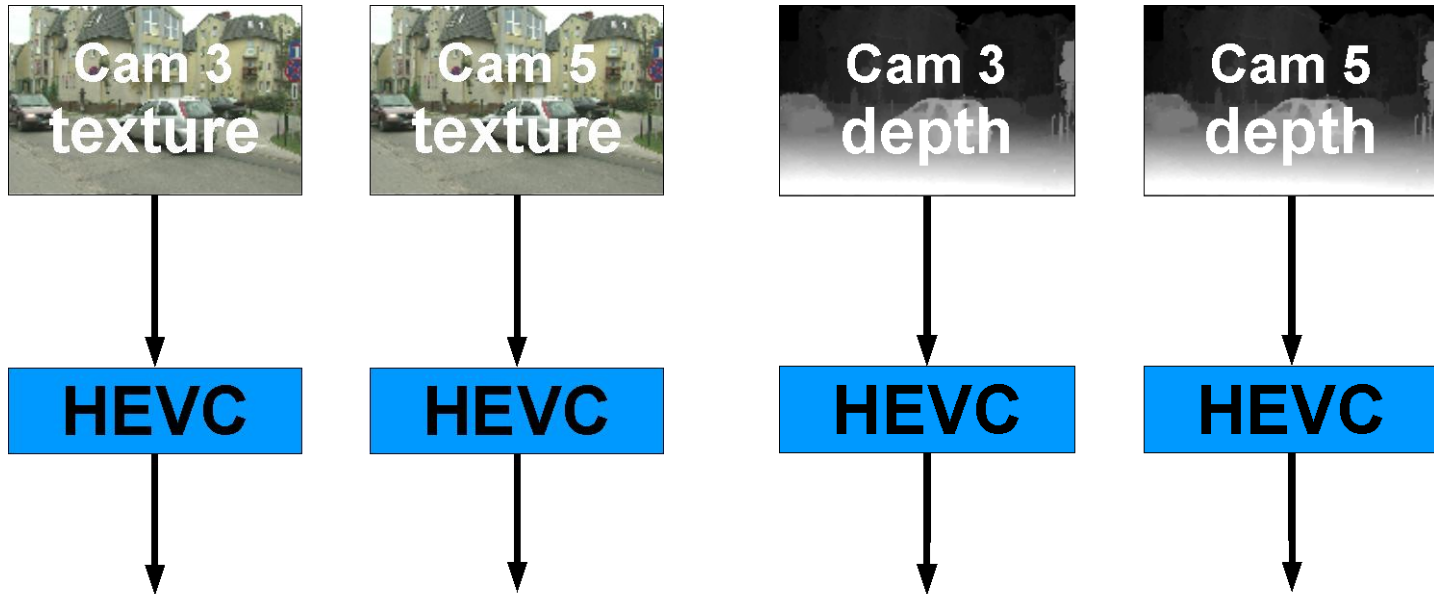
- MPEG-4 MVC – JMVC 6.0 is used separately for texture and depth as in EE





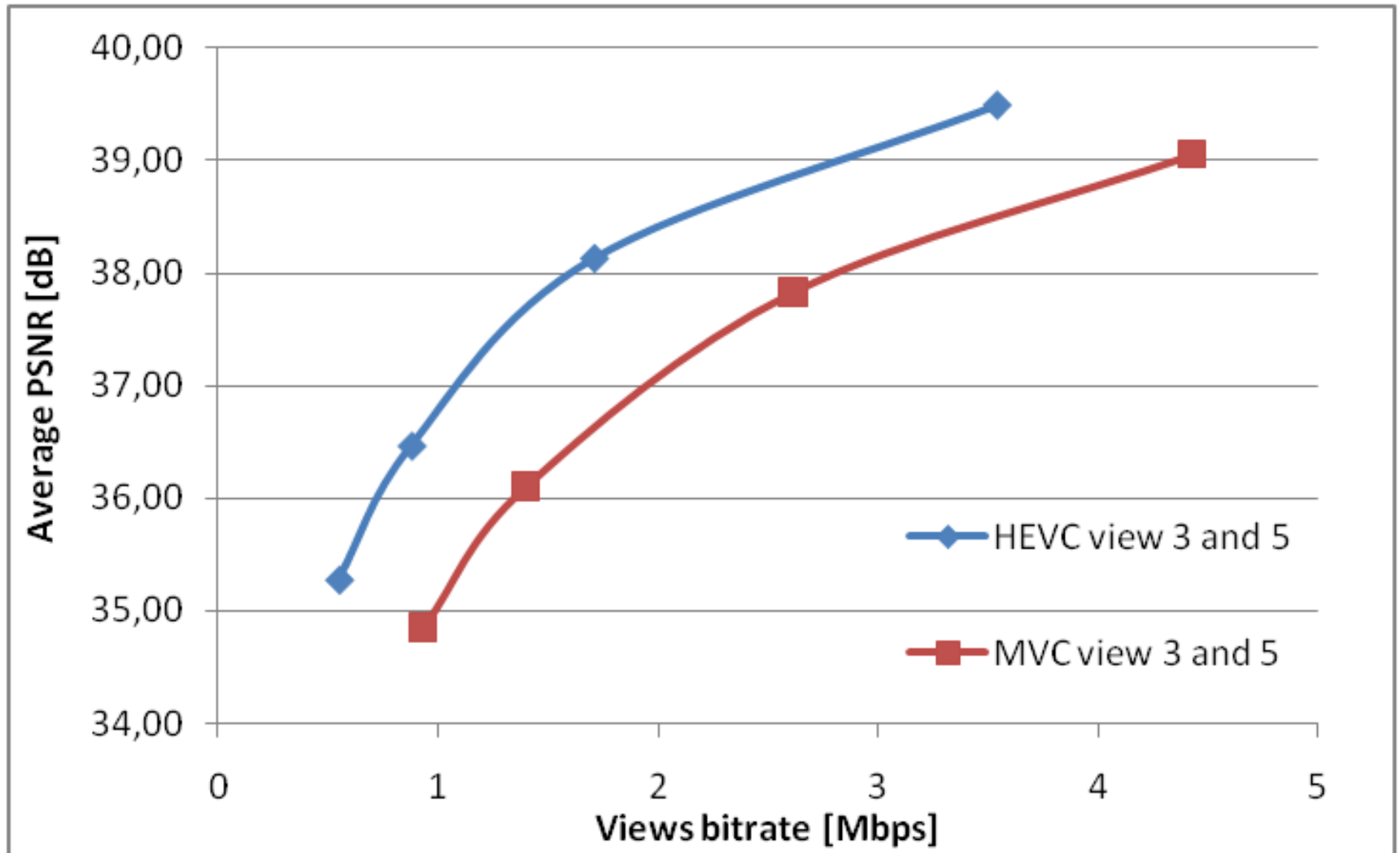
Prospective HEVC technology

- Prospective HEVC technology- Samsung proposal is used in simulcast mode



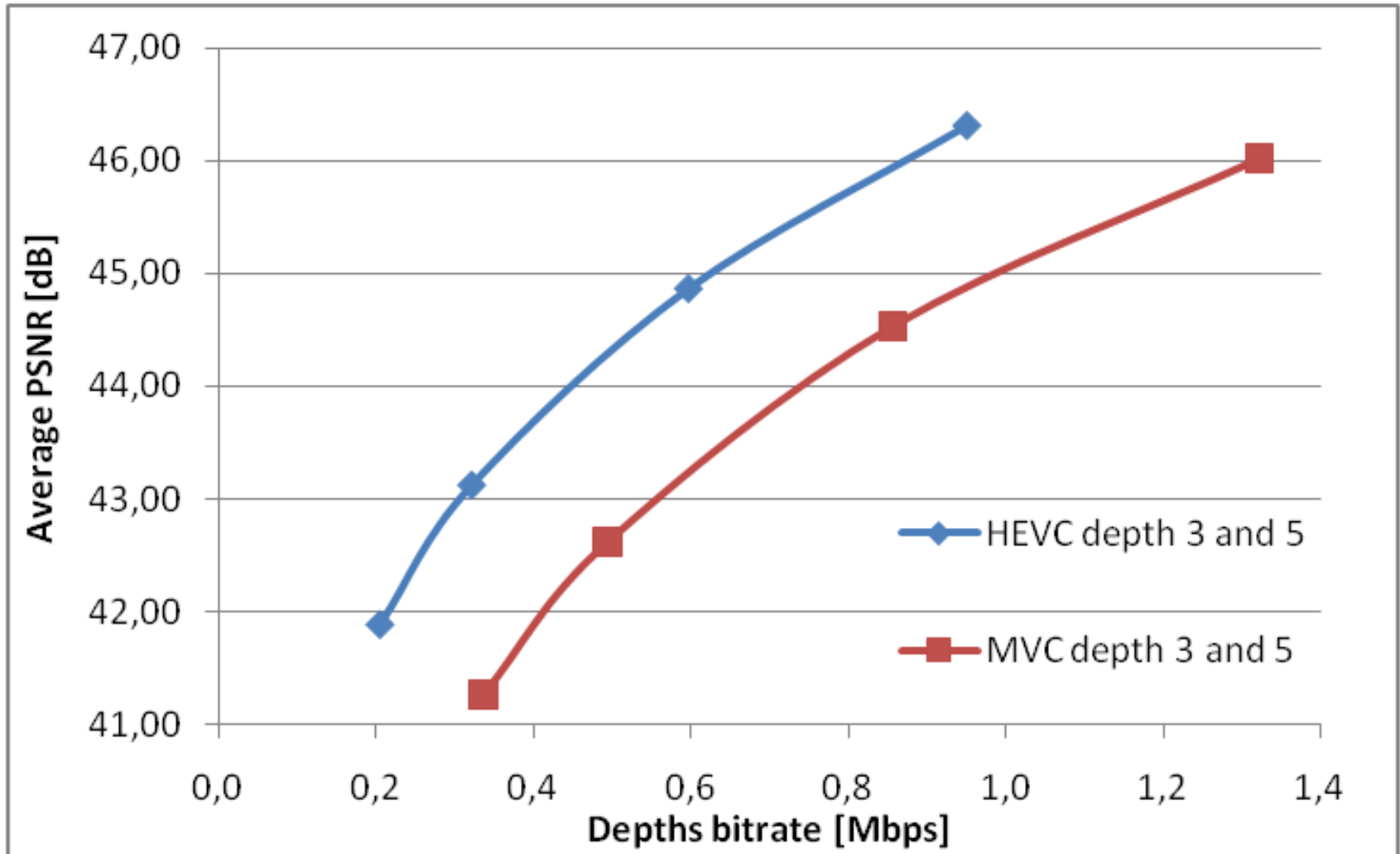


Texture data results





Depth data results





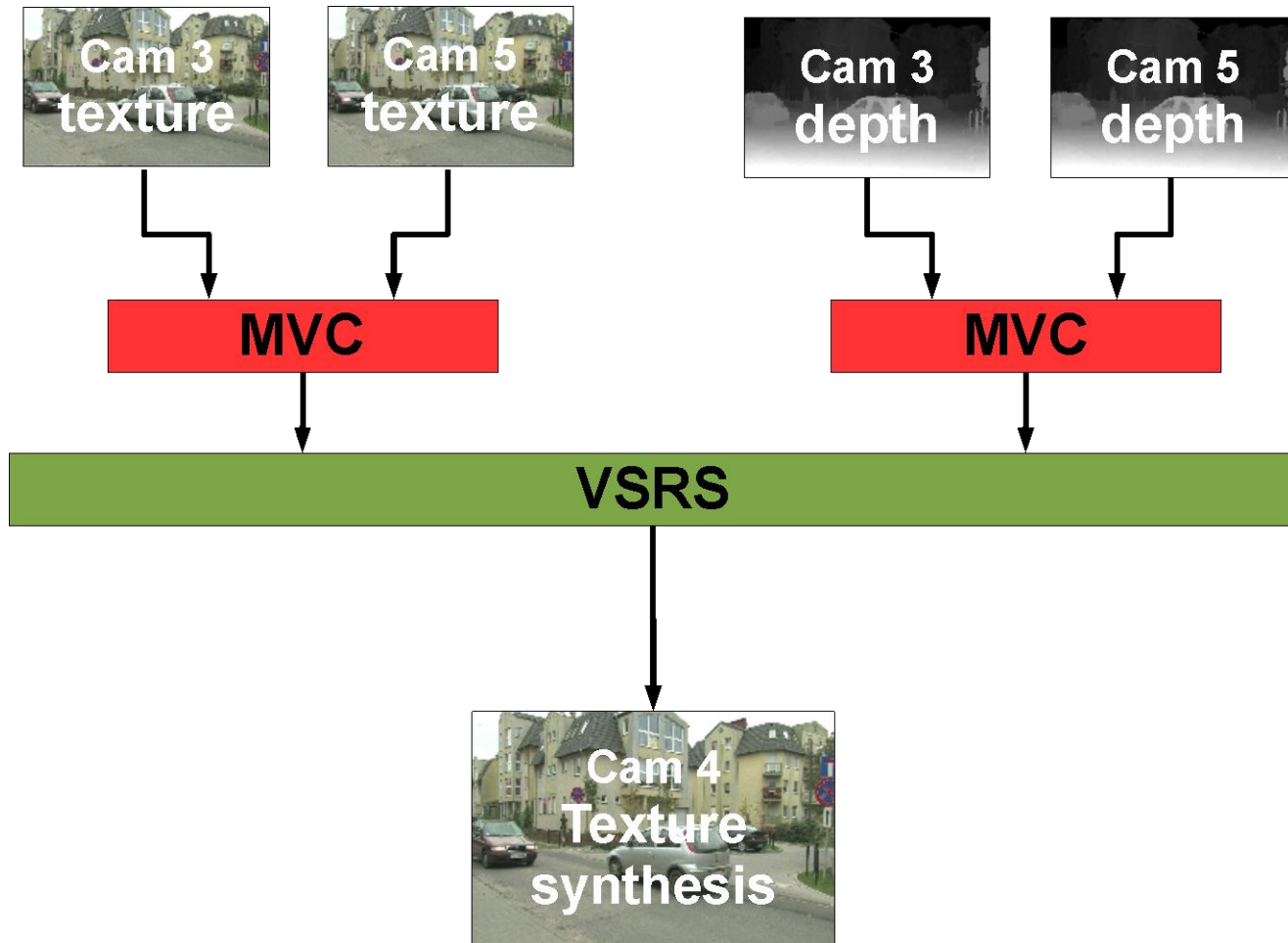
Bjontegaard metric

MPEG-4 MVC		Samsung HEVC proposal		BJM for Texture	
Bitrate [Mbps]	PSNR-Y [dB]	Bitrate [Mbps]	PSNR-Y [dB]	PSNR mode	rate mode
4,43	39,06	3,54	39,49	1,38	-43,42
2,61	37,84	1,71	38,13		
1,40	36,10	0,88	36,47		
0,93	34,85	0,55	35,28		

MPEG-4 MVC		Samsung HEVC proposal		BJM for Depth	
Bitrate [Mbps]	PSNR-Y [dB]	Bitrate [Mbps]	PSNR-Y [dB]	PSNR mode	rate mode
1,32	46,01	0,95	46,30	1,64	-40,72
0,86	44,53	0,60	44,86		
0,49	42,62	0,32	43,12		
0,34	41,26	0,21	41,89		

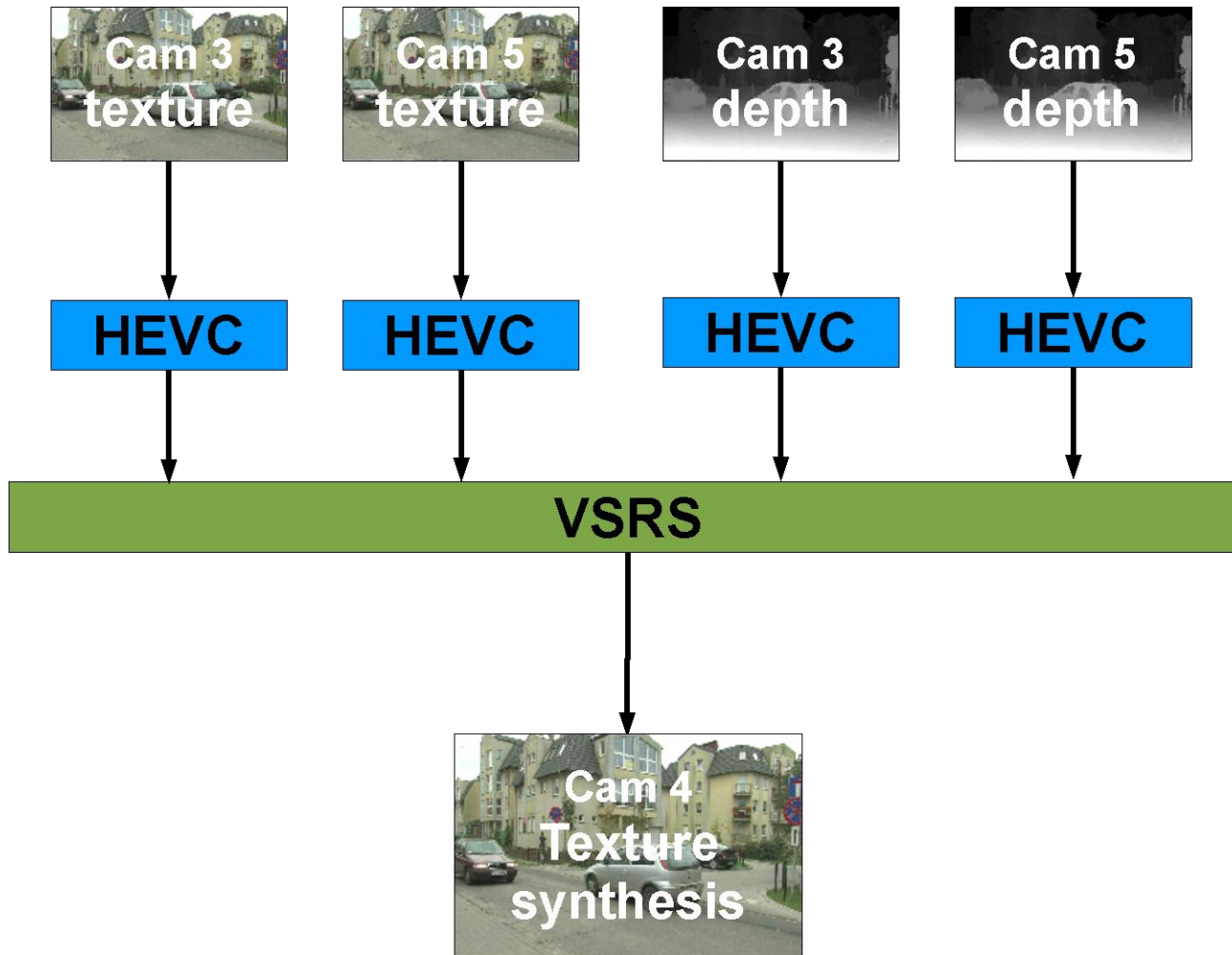


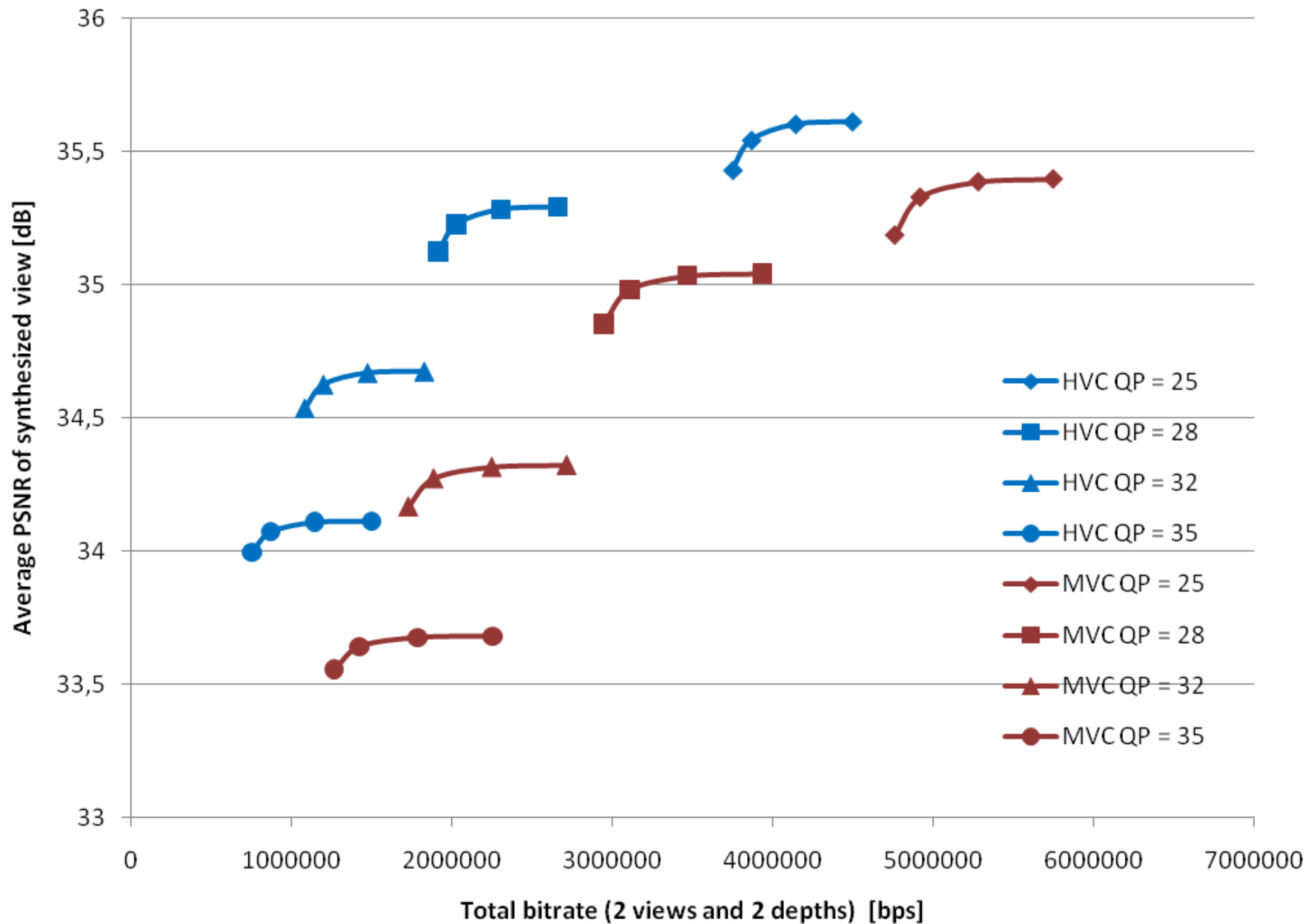
Synthesis





Synthesis







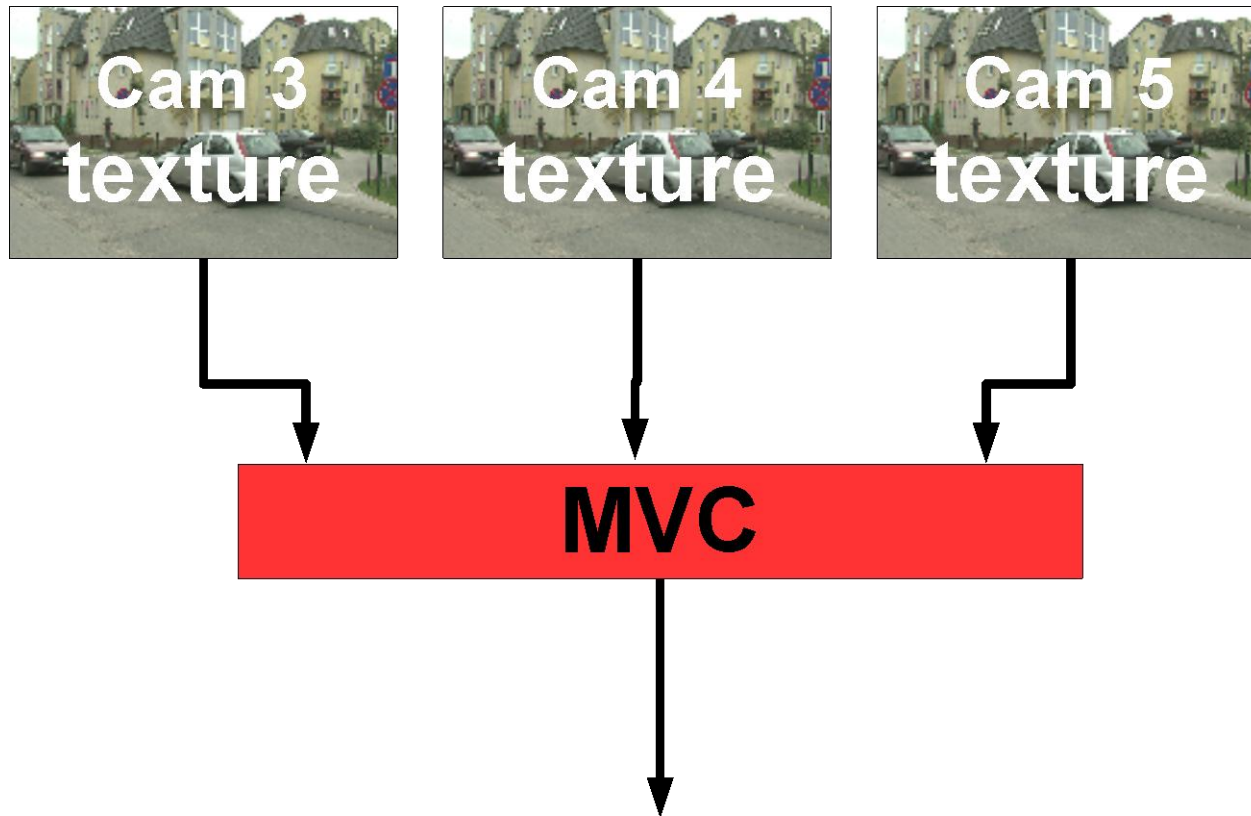
Three View Case

- View 3, 4 and 5 was used
- Only texture data was coded
- Parameters
 - QP Texture: 25 28 32 35
 - QD Depth: 25 28 32 35
 - GOP – 16
 - Full HD sequence – Poznan Street - 200 frames



MPEG-4 MVC

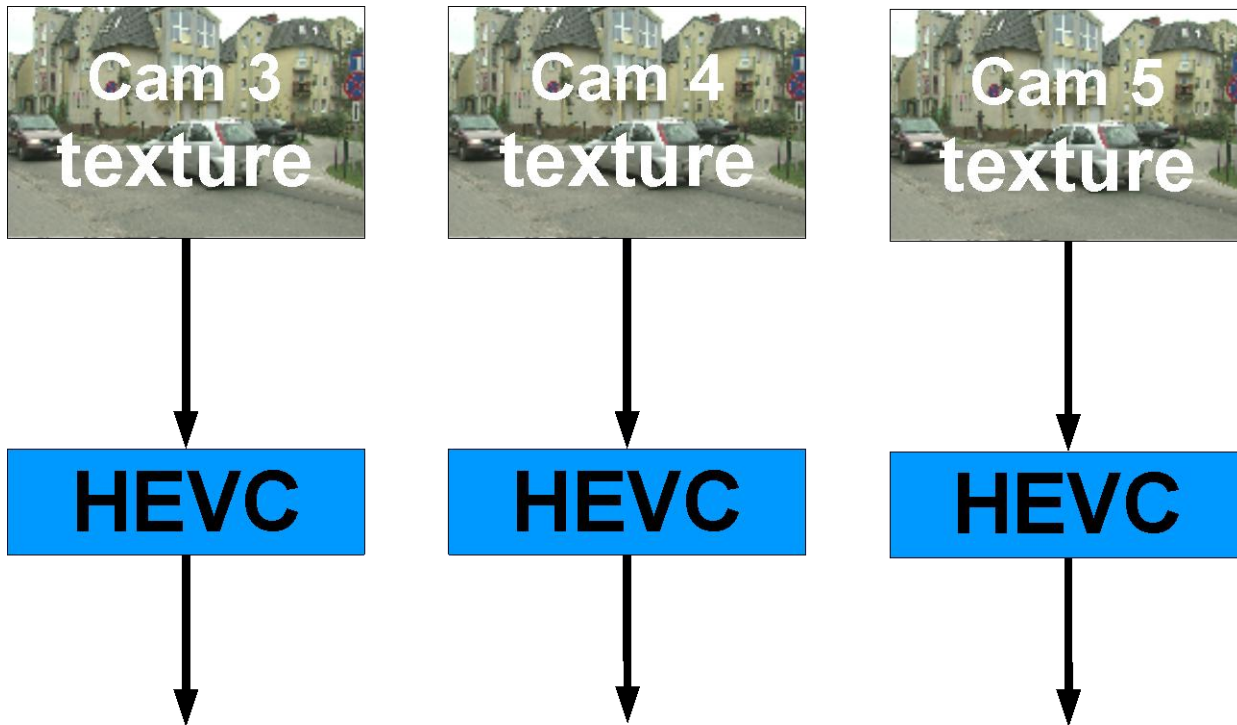
- MPEG-4 MVC – JMVC 6.0

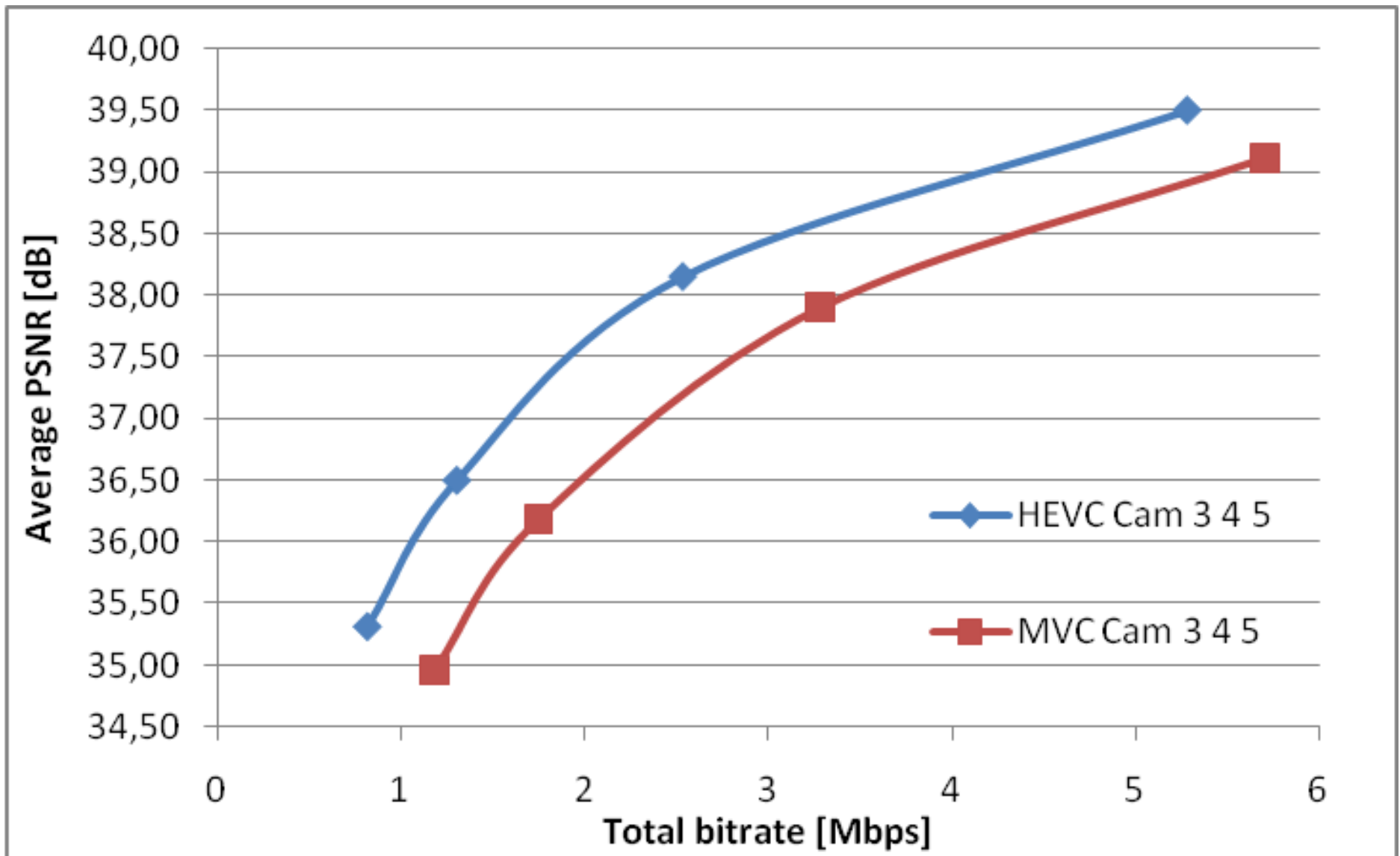




Prospective HEVC technology

- Prospective HEVC technology- Samsung proposal is used in simulcast mode







Bjontegaard metric

MPEG-4 MVC		Samsung HEVC proposal		BJM for Texture	
Bitrate [Mbps]	PSNR-Y [dB]	Bitrate [Mbps]	PSNR-Y [dB]	PSNR mode	rate mode
5,70	39,11	5,28	39,50	0,91	-32,16
3,28	37,90	2,53	38,15		
1,75	36,19	1,30	36,50		
1,18	34,96	0,81	35,31		



Conclusions

- The results show that even initially proposed HEVC codec even used in simulcast mode outperforms MPEG-4 MVC codec.
- Final HEVC coding standard will have even better performance.
- Moreover it is expected that implementing in HEVC tools from MPEG-4 MVC (like inter view prediction) would increase the coding efficiency of HEVC even further.



Conclusions

- These tests are preliminary and should be extended onto other multiview test sequences. Nevertheless, the results for “Poznan street” are very clear.
- We conclude that the requirement of backward compatibility with MPEG-4 MVC might compromise compression performance of the future 3D video standard codecs.



Recommendation

- With respect to the results presented above, we propose to exclude the requirement of backward compatibility with MPEG-4 MVC from the Requirements and Call for Proposals for 3D Video coding technique.



Thanks for your attention!

- Questions?