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Title	**Results of Exploration Experiments in 3D Video Coding, described in w10552, for 'Newspaper' sequence.**
Sub group	**Video**
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1 Introduction

This document presents results of Exploration Experiment (EE1) performed on "Newspaper" sequence [2] and is in response to w10552 "Description of Exploration Experiments in 3D Video Coding" [1].

2 Experiments conditions

Experiments were performed as follows (Figure 1):

- **Select stereo pair** from data set, i.e. an original left view OL and an original right view OR (OL=4, OR=6)
- **Estimate depth** corresponding to neighboring original views OL (left) and OR (right), from neighboring cameras with various camera distances
- **Synthesize views** (synthesized left SL and synthesized right SR) at positions from OL+D and OR+D
- **Compare OL-OR with SL-SR** subjectively

The test were performed on 'Newspaper' [2] sequence with following views selected as OL-OR and NL-NR.

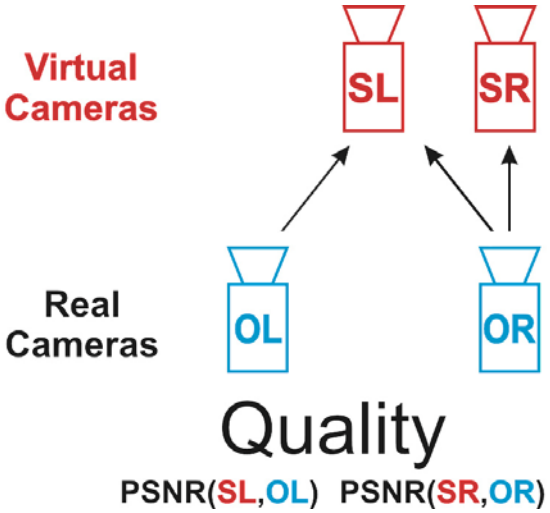
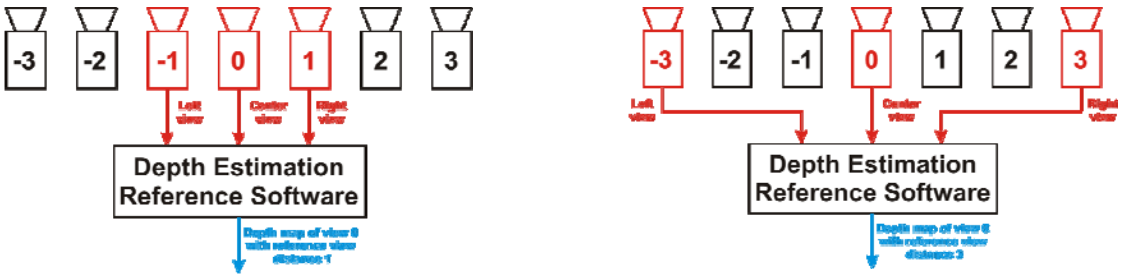


Figure 1. Setup of experiments for depth-estimation/view-synthesis software evaluation.

Table 1: Input and output views for MVD representation format.

Data set	Original Pair OL-OR	Synthesized Pair SL-OR (OL-SR)
Newspaper	4-6	5-6

The depth estimation was performed with various Camera Distance (Figure 2) parameters– from distance 1 to distance 5.



a) Camera distance 1 b) Camera distance 3

Figure 2. Setup of experiments for depth-estimation/view-synthesis software evaluation.

3 Results –EE1 – Semi automatic depth estimation

3.1 Synthesis quality evaluation

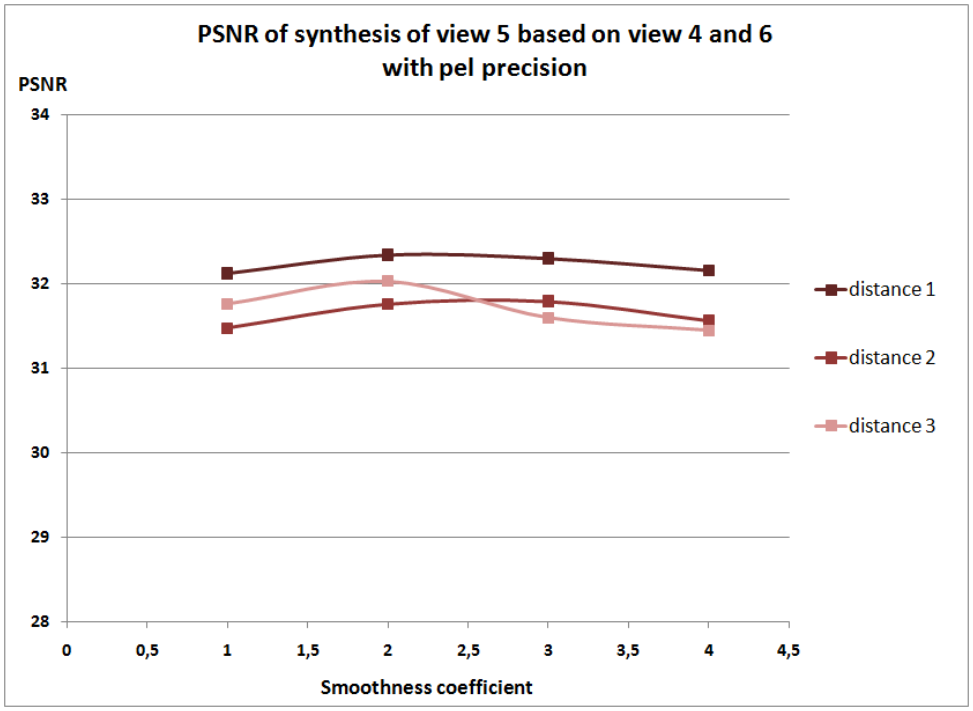


Figure 3. Results of view synthesis based on depth maps produced with DERS with **Pel** precision

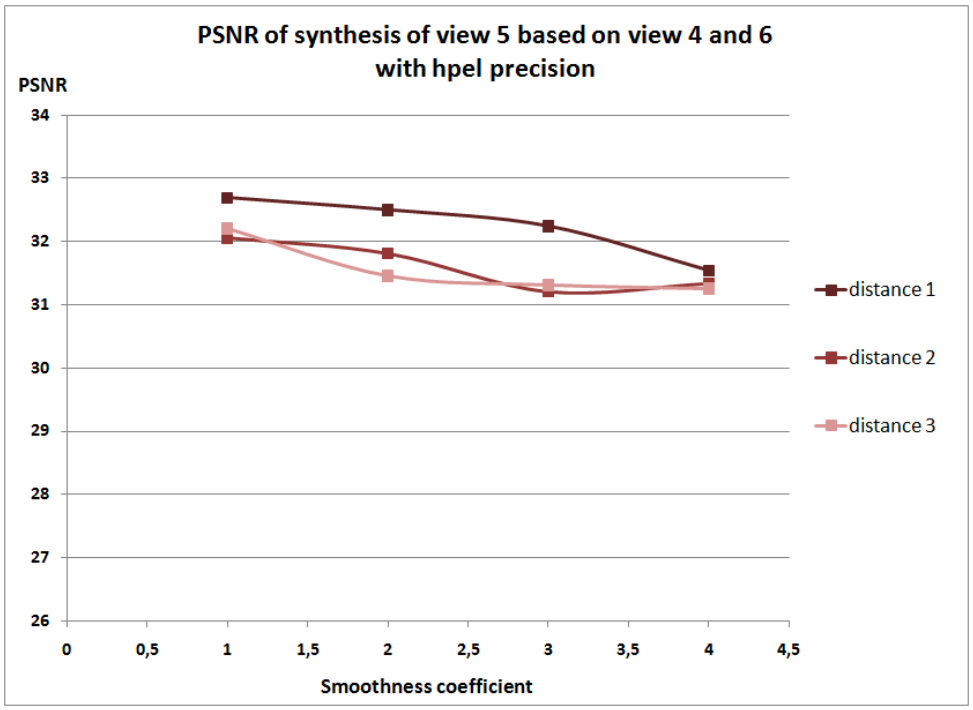


Figure 4. Results of view synthesis based on depth maps produced with DERS with **HPel** precision

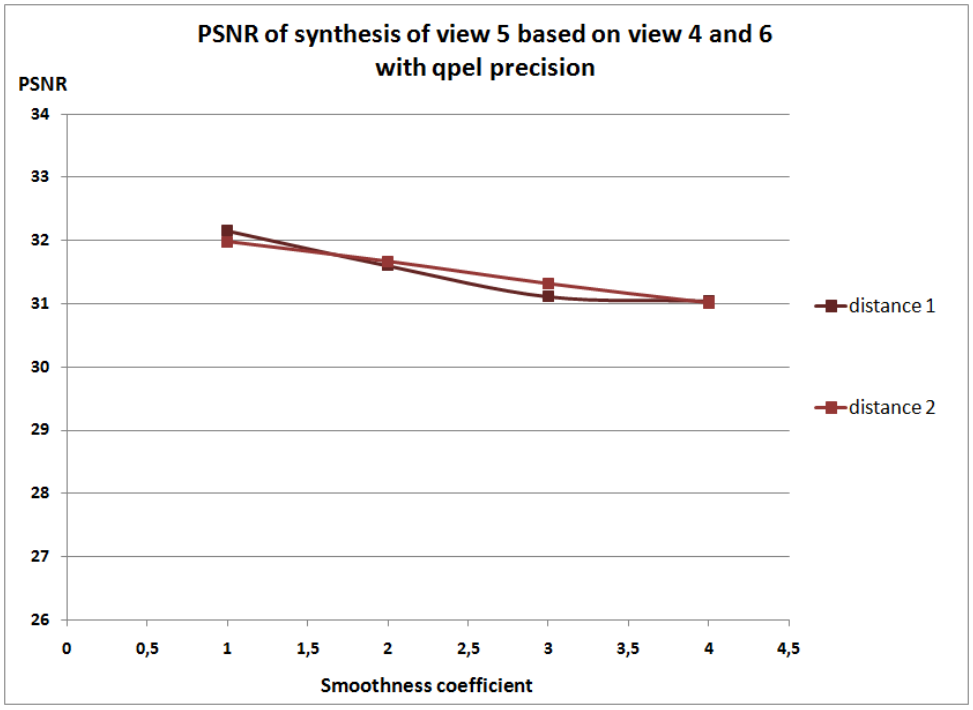


Figure 5. Results of view synthesis based on depth maps produced with DERS with **QPel** precision

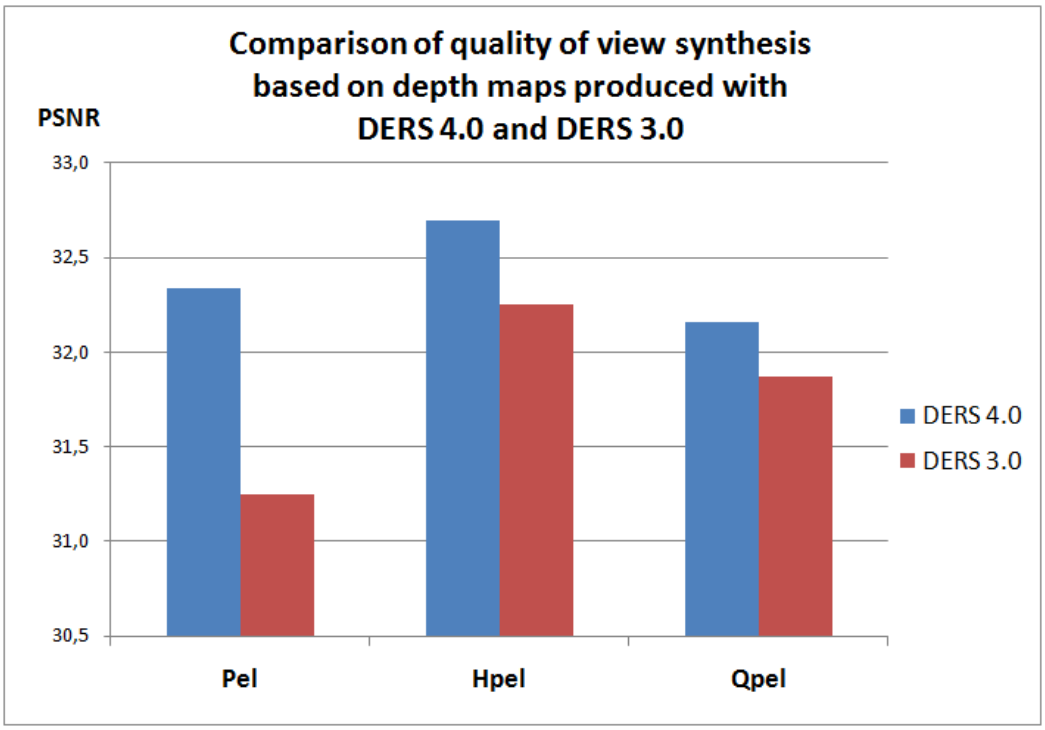


Figure 6. Comparison of results of view synthesis based on depth maps produced with **DERS 4.0** and **DERS 3.0**

3.2 Pixel/half-pel/quarter-pel comparison

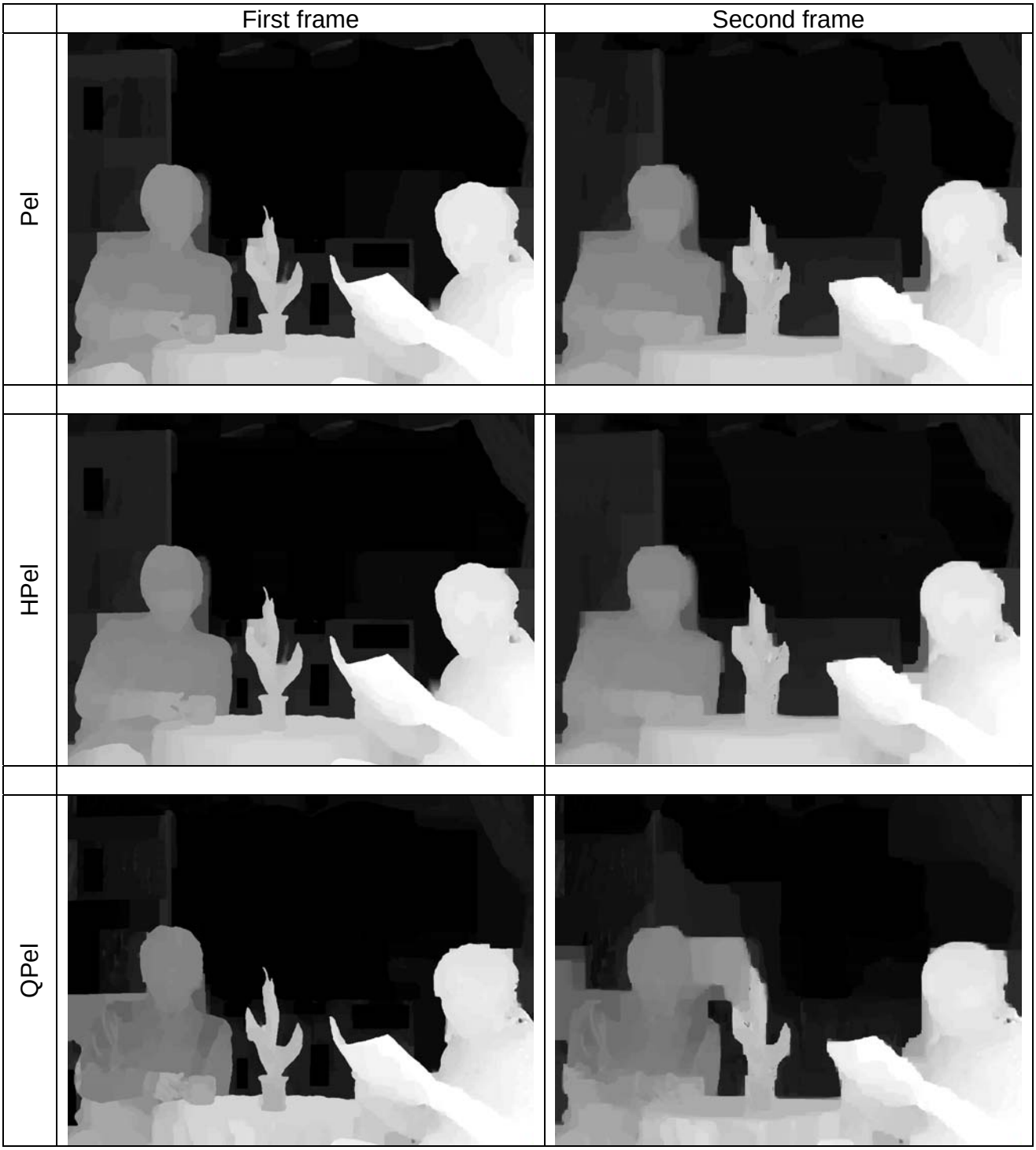


Figure 7. Comparison of depth maps for first and second frame of the 'Newspaper' sequence, between various pixel modes.

4 Conclusions

The conclusions are as follows:

- Results attained with use of Semi-automatic DERS are about 2dB better than previous version of DERS.
- Subjective quality of synthesized views is also slightly better.
- Half-pixel is the best mode for 'Newspaper' sequence – it is about 0.3dB better than Pel-precision, which is about 0.2dB better than quarter precision.
- Quarter-pixel precision is deprecated because it leads to strange artificial flickering in depth

5 Recomendation

- To investigate depth flickering in sub-pixel (Quarter, Half-pixel) modes.

6 Acknowledgement

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7 References

[1] "Description of Exploration Experiments in 3D Video Coding" MPEG 2008/W10173, Busan, Korea, October 2008.

[2] Yo-Sung Ho, Eun-Kyung Lee, and Cheon Lee "Multiview Video Test Sequence and Camera Parameters", ISO/IEC JTC1/SC29/WG11, MPEG 2008/M15419, Archamps, France, April 2008.