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| **Joint Collaborative Team on Video Coding (JCT-VC)**  **of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11**  13th Meeting: Incheon, KR, 18–26 Apr. 2013 | Document: JCTVC-M0238 |

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| *Title:* | **SCE4: Crosschecking of SCE4: Results of test 4.2.4 on chroma enhancement for inter layer prediction (JCTVC-M0183)** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Proposal | | |
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# Abstract

This contribution reports crosschecking results of JCTVC-M0183 on chroma enhancement for inter layer prediction in SHVC. The simulation results reportedly matched those provided by the proponents.

# Introduction

In JCTVC-M0183, a method was proposed to enhance chroma components with information from luma component when generating inter-layer reference (ILR) pictures.

Figure 1 shows the relative luma and chroma sample positions in 4:2:0 color format. Each chroma sample (red dot) in an ILR picture is enhanced by adding an appropriate offset, where the offset is the result of filtering the surrounding 3×4 luma samples (white squares) by a high-pass filter. The coefficients of the high-pass filter are signaled for each chroma component in an enhancement layer picture.

At decoder, enhanced chroma samples are generally calculated as follows

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where , and represent chroma and luma samples at location in the ILR picture (up-sampled when necessary), and indicate the two 3×4 high-pass filters, and denote the enhanced chroma samples. Please note that (1) shows the general idea. Additional operations like scaling are needed for the second term of (1) to finally derive enhanced chroma samples. With the method, 13 multiplications (additional one for scaling) and 12 additions are needed for each chroma sample.

In addition, a new version (v2) with encoder optimization method was proposed after the SCE4 deadline to further improve the BD rate performance of the method. With this optimization, the chroma enhancement may be adaptively switched off at picture level.



Figure 1. Relative Luma and Chroma sample positions in 4:2:0 color subsampling format (JCTVC-M0183)

# Experimental results

We received the source code from the proponents, implemented in SHM-1.0, and did a quick code study to verify that the proposed method was implemented as described. We used the common conditions [2] in our experiments and ran simulations for the cases of RA, LDP and LDB.

The results match what was provided by the proponents and are summarized as follows

## RefIdx framework with chroma enhancement always on



## RefIdx framework with adaptive chroma enhancement at picture level



## IBL framework with adaptive chroma enhancement at picture level



# Conclusion

In this contribution, we have presented the results of our cross-check of JCTVC-M0183. The implemented algorithm is in line with the proponent’s description, and the simulation results also match that provided by the proponents.

# References

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