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| *Title:* | **AHG14: cross-checking results of JCTVC-Y0041 on chroma resampling filters for HDR/WCG Coding** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Cross-check report | | |
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# Abstract

This document reports crosscheck results for proposal JCTVC-Y0041 on chroma resampling methods for HDR/WCG video signals. JCTVC-Y0041 evaluates different chroma resampling filters used in an HDR conversion chain. These filters are implemented in current HDRTools package. Cross-checking results reportedly confirm perfect matching with the objective results reported in JCTVC-Y0041.

# Introduction

Contribution JCTVC-Y0041 evaluates the following chroma resampling filters, implemented in HDRTools, for converting a linear-light RGB HDR signal to YCbCr 4:2:0 PQ 10-bit and back converting to RGB linear-light. No compression is used in the tests.

The following filters have been evaluated and cross-checked:

* FastVDO filter
  + Down:
    - H : {+8.0, 0.0, -64.0, +128.0, +368.0, +128.0, -64.0, 0.0, +8.0}/512 ,
    - V: {+8.0, 0.0, -24.0, +48.0, +224.0, +224.0, +48.0, -24.0, +0.0, +8.0}/512
  + Up: {-1,9,9,-1}/16
* Adaptive Filter (Multi Down\_Up)
* GS\_Filter
* TM\_Filter
  + Down:
    - H={+21.0, +0.0, -52.0, +0.0, +159.0, +256.0, +159.0, +0.0, -52.0, 0.0, +21.0}/512
    - V={+5.0, +11.0, -21.0, -37.0, +70.0, +228.0, +228.0, +70.0, -37.0, -21.0, +11.0, +5.0}/512
  + Up: {+21.0, -52.0, +159.0, +159.0, -52.0, +21.0}/256
* Default Filter 1
  + Down:
    - H={1,6, 1}
    - V={1, 1}
  + Up: 4-tap defined in MPEG document w14548 (section 2.4.11)
* Default Filter 2
  + Down:
    - H={1, 2, 1}
    - V={1, 1}
  + Up: 4-tap defined in MPEG document w14548 (section 2.4.11)

# Simulation results

Simulations are performed on Linux platform.

The metrics (R-PSNR, G-PSNR, B-PSNR, tPSNR X, tPSNR Y , tPSNR, Z, tPSNR XYZ, tOSNR-XYZ, DE100, MD100, PSNRL100) are computed between the source linear-light RGB HDR signal, and the linear-light RGB HDR signal resulting from the conversion and back conversion.

As shown in the attached xls file, a perfect match is obtained for all cases.

Results (dB) are summarized in following table.



And below, the difference (in dB) of the 5 last filters compared to the FastVDO filters. For most of the metrics, FastVDO filters show a gain compared to the other filters.



# Conclusion

The objective results reported in JCTVC-Y0041 are confirmed by the cross-checker.