|  |  |
| --- | --- |
| **Joint Collaborative Team on 3D Video Coding Extension Development**  **of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11**  5th Meeting: Vienna, AT, 27 July – 2 Aug. 2013 | Document: JCT3V- E0158 |

|  |  |  |  |
| --- | --- | --- | --- |
| *Title:* | **CE 6.h: Results on Removal of DC from SDC Mode** | | |
| *Status:* | Input Document | | |
| *Purpose:* | Proposal | | |
| *Author(s) or Contact(s):* | Hongbin Liu ([hongbin.liu@lge.com](mailto:hongbin.liu@lge.com))  Jie Jia ([jie.jia@lge.com](mailto:jie.jia@lge.com))  Jin Heo ([jin78.heo@lge.com](mailto:jin78.heo@lge.com))  Junghak Nam ([junghak.nam@lge.com](mailto:junghak.nam@lge.com)) |  |  |
| *Source:* | LG Electronics | | |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Abstract

This contribution reports result of JCT3V-D0066 which removes DC from SDC mode to further simplify SDC mode. It is reported that there is negligible compress performance loss in both CTC and All Intra case.

# Proposed Method

In 3D-HEVC, DC, DMM1 and Planar are included in SDC coding [1]. However, DC mode is selected with very low probability. Consequently, this contribution proposes to remove DC from SDC mode to further simplify SDC.

# Results

Proposed method is integrated into HTM 7.0r1 software and compared with it. Both CTC [2] and All Intra case are tested, and results are shown in Table 1 and Table 2 respectively. As shown in Table 1 and 2, there is negligible influence on compression performance in both CTC and All Intra case.

**2.1 compared with HTM-7.0r1**

Table 1: performance comparison with HTM-7.0r1 (CTC)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | video 0 | video 1 | video 2 | video PSNR / video bitrate | video PSNR / total bitrate | synth PSNR / total bitrate | enc time | dec time |
| Balloons | 0.00% | 0.02% | -0.01% | 0.00% | -0.02% | 0.06% | 84.2% | 99.6% |
| Kendo | 0.00% | 0.12% | -0.13% | 0.00% | 0.05% | 0.06% | 114.9% | 96.0% |
| Newspaper\_CC | 0.00% | -0.04% | -0.11% | -0.02% | 0.00% | -0.29% | 88.7% | 99.8% |
| GT\_Fly | 0.00% | 0.17% | -0.09% | -0.01% | 0.00% | -0.01% | 100.0% | 100.8% |
| Poznan\_Hall2 | 0.00% | 0.34% | 0.06% | 0.06% | 0.03% | 0.09% | 88.1% | 100.9% |
| Poznan\_Street | 0.00% | 0.02% | 0.10% | 0.01% | 0.01% | 0.00% | 89.4% | 98.6% |
| Undo\_Dancer | 0.00% | -0.17% | 0.05% | -0.02% | -0.04% | 0.05% | 100.1% | 102.0% |
| 1024x768 | 0.00% | 0.03% | -0.09% | 0.00% | 0.01% | -0.06% | 95.9% | 98.5% |
| 1920x1088 | 0.00% | 0.09% | 0.03% | 0.01% | 0.00% | 0.03% | 94.4% | 100.6% |
| **average** | **0.00%** | **0.06%** | **-0.02%** | **0.00%** | **0.00%** | **-0.01%** | **95.1%** | **99.7%** |

Table 2: performance comparison with HTM-7.0r1 (All Intra)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | video 0 | video 1 | video 2 | video PSNR / video bitrate | video PSNR / total bitrate | synth PSNR / total bitrate | enc time | dec time |
| Balloons | 0.00% | 0.00% | 0.00% | 0.00% | 0.04% | 0.08% | 133.9% | 100.8% |
| Kendo | 0.00% | 0.00% | 0.00% | 0.00% | 0.05% | 0.06% | 122.3% | 100.6% |
| Newspaper\_CC | 0.00% | 0.00% | 0.00% | 0.00% | 0.07% | 0.08% | 104.5% | 101.1% |
| GT\_Fly | 0.00% | 0.00% | 0.00% | 0.00% | 0.04% | 0.09% | 98.3% | 100.7% |
| Poznan\_Hall2 | 0.00% | 0.00% | 0.00% | 0.00% | -0.02% | 0.07% | 108.9% | 101.0% |
| Poznan\_Street | 0.00% | 0.00% | 0.00% | 0.00% | 0.02% | 0.03% | 101.6% | 101.0% |
| Undo\_Dancer | 0.00% | 0.00% | 0.00% | 0.00% | -0.01% | 0.00% | 103.3% | 101.0% |
| 1024x768 | 0.00% | 0.00% | 0.00% | 0.00% | 0.05% | 0.07% | 120.2% | 100.8% |
| 1920x1088 | 0.00% | 0.00% | 0.00% | 0.00% | 0.01% | 0.05% | 103.0% | 100.9% |
| **average** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.03%** | **0.06%** | **110.4%** | **100.9%** |

# Conclusion

This contribution proposes to remove DC from SDC to further simplify SDC. Proposed method brings negligible compression loss. We recommend that proposed method adopted into 3D-HEVC.

# Reference

[1] G. Tech, K. Wegner, Y. Chen, S. Yea, “3D-HEVC Test Model 4”, Doc. JCT3V-D1005, Inchon, KR, 20–26 Apr. 2013.

[2] D. Rusanovskyy, K. Müller, A. Vetro, “Common Test Conditions of 3DV Core Experiments”, Doc. JCT3V-D1100, Inchon, KR, 20–26 Apr. 2013.

# Patent rights declaration(s)

**LG Electronics / LG Electronics (China) R&D Center may have current or pending patent rights relating to the technology described in this contribution and, conditioned on reciprocity, is prepared to grant licenses under reasonable and non-discriminatory terms as necessary for implementation of the resulting ITU-T Recommendation | ISO/IEC International Standard (per box 2 of the ITU-T/ITU-R/ISO/IEC patent statement and licensing declaration form).**