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| *Title:* | **CE6.h related : Removal of DC from SDC Mode** | | |
| *Status:* | Input Document | | |
| *Purpose:* | Proposal | | |
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# Abstract

This contribution proposes to remove DC from SDC mode to further simplify SDC mode. It is reported that there is no compress performance loss or even minor coding gain 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 in SDC is inefficient because: 1. it is selected with low probability, 2. 2 bits are required to represent binary index of DMM1 and Planar because binary index of DC is represented with 1 bit, as shown in Table 1.

Table1 – Binary index of sdc mode

|  |  |
| --- | --- |
| **Binary Index** | Associated Intra Prediction Mode |
| 1 | DC |
| 01 | DMM1 |
| 00 | Planar |

To solve this problem, this contribution proposes to remove DC from SDC mode. After removing DC from SDC, only 1 bit is required to represent index of DMM1 and Planar as shown in Table 2.

Table2 – Binary index of sdc mode

|  |  |
| --- | --- |
| **Binary Index** | Associated Intra Prediction Mode |
| 1 | DMM1 |
| 0 | Planar |

# Results

Proposed method is integrated into 3DV-HTM 6.0 software and compared with it. Both CTC [2] and All Intra case are tested, and results are shown in Table 3 and Table 4 respectively. As shown in Table 3 and 4, there is -0.1% coding gain on synthesized view in both CTC and All Intra case.

**2.1 compared with HTM-6.0**

Table 3: performance comparison with HTM-6.0 (CTC)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | video 0 | video 1 | video 2 | video PSNR / video bitrate | video PSNR / total bitrate | synth PSNR / total bitrate | enc time | dec time |
| Balloons | 0.0% | -0.1% | -0.1% | 0.0% | 0.0% | -0.1% | 99.9% | 99.9% |
| Kendo | 0.0% | 0.1% | 0.2% | 0.0% | 0.0% | -0.1% | 100.0% | 100.0% |
| Newspaper\_CC | 0.0% | 0.0% | 0.1% | 0.0% | 0.0% | -0.1% | 99.6% | 100.0% |
| GT\_Fly | 0.0% | 0.0% | 0.1% | 0.0% | 0.0% | 0.0% | 100.1% | 100.0% |
| Poznan\_Hall2 | 0.0% | -0.2% | -0.9% | -0.2% | -0.3% | -0.3% | 99.5% | 99.7% |
| Poznan\_Street | 0.0% | 0.4% | 0.1% | 0.1% | 0.0% | 0.0% | 99.6% | 100.1% |
| Undo\_Dancer | 0.0% | -0.1% | -0.1% | 0.0% | 0.0% | -0.5% | 99.5% | 99.9% |
| 1024x768 | 0.0% | 0.0% | 0.1% | 0.0% | 0.0% | -0.1% | 99.8% | 100.0% |
| 1920x1088 | 0.0% | 0.0% | -0.2% | -0.1% | -0.1% | -0.2% | 99.7% | 99.9% |
| **average** | **0.0%** | **0.0%** | **-0.1%** | **0.0%** | **0.0%** | **-0.1%** | **99.7%** | **99.9%** |

Table 4: performance comparison with HTM-6.0 (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 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 99.4% | 98.4% |
| Kendo | 0.0% | 0.0% | 0.0% | 0.0% | -0.1% | -0.1% | 100.3% | 97.7% |
| Newspaper\_CC | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | -0.1% | 99.1% | 100.6% |
| GT\_Fly | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 113.1% | 101.1% |
| Poznan\_Hall2 | 0.0% | 0.0% | 0.0% | 0.0% | -0.1% | -0.1% | 110.3% | 99.0% |
| Poznan\_Street | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | -0.1% | 109.7% | 101.3% |
| Undo\_Dancer | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 115.1% | 100.8% |
| 1024x768 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | -0.1% | 99.6% | 98.9% |
| 1920x1088 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | -0.1% | 112.1% | 100.5% |
| **average** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **-0.1%** | **106.7%** | **99.8%** |

# Conclusion

This contribution proposes to remove DC from SDC to further simplify SDC. Proposed method brings no 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 3”, Doc. JCT3V-C1005, Geneva, Swizerland, 17–23 Jan. 2013.

[2] D. Rusanovskyy, K. Müller, A. Vetro, “Common Test Conditions of 3DV Core Experiments”, Doc. JCT3V-C1100, Geneva, Swizerland, 17–23 Jan. 2013.

# Patent rights declaration(s)

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