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| *Title:* | CE6: Cross-check report for Subtest CE6b on Intra Mode Coding | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Report | | |
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# Abstract

CE6b aims to improve the coding performance of Intra mode coding of the HEVC Test Model. This contribution presents a summary of the results and observations from the experiments performed by Institute for Infocomm Research. The coding results obtained reportedly match what was provided by the proponents.

# Introduction

CE6b aims to enhance Intra mode coding of the HEVC Test Model by investigating most probable modes (MPM) derivation and remaining mode coding.

In HM4, two MPMs are used. JCTVC-F062 [1] and JCTVC-F459 [2] propose the addition of more MPMs. On the other hand, JCTVC-F091 [3], JCTVC-F106 [4] and JCTVC-F269 [5] relate to remaining mode coding.

The cross-checks are performed for JCTVC-F269 with 2 and 3 MPMs. When 2 MPMs are used, the MPM derivation process is as in HM4, i.e. the 2 MPMs are set to the intra prediction mode of the above prediction unit (PU) (ModeA) and the intra prediction mode of the left PU (ModeL). When ModeA and ModeL are the same, the Planar or DC mode will be used. When 3 MPMs are used, the solution is a combination of tools from the above proposals. To obtain 3 MPMs, an additional intra prediction mode is derived from the larger of the 2 MPMs. This utilises 3 look-up tables (4+19+35 entries). In addition, some counter tables and mode ranking tables are needed for performing re-ranking of intra prediction modes before coding their rank orders. Furthermore, 4 binarization tables (2x17 + 2x33 entries) in CABAC and 4 VLC tables (2x16 + 2x33 entries) in CAVLC are also used in coding the remaining modes.

# Simulation Results

The proposed modifications were implemented on HM 4.0. Tests were conducted using the two All-Intra configurations, i.e. high-efficiency and low complexity, following the common testing conditions [6].

Table 1 and 2 show the cross-check results of JCTVC-F269 with (1) 2MPMs and (2) 3 MPMs.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **All Intra HE** | | | **All Intra LC** | | |
|  | Y | U | V | Y | U | V |
| Class A | -0.3% | -0.1% | 0.0% | -0.2% | -0.1% | -0.1% |
| Class B | -0.3% | 0.0% | -0.1% | -0.2% | -0.1% | -0.1% |
| Class C | -0.3% | -0.1% | -0.1% | -0.2% | -0.2% | -0.2% |
| Class D | -0.1% | 0.0% | -0.1% | -0.1% | -0.1% | -0.1% |
| Class E | -0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% |
| **Overall** | -0.2% | 0.0% | -0.1% | -0.1% | -0.1% | -0.1% |
|  | -0.2% | 0.0% | -0.1% | -0.1% | -0.1% | -0.1% |
| Enc Time[%] | 99% | | | 100% | | |
| Dec Time[%] | 98% | | | 98% | | |

Table 1. Cross-check results for JCTVC-F269 with 2MPMs.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **All Intra HE** | | | **All Intra LC** | | |
|  | Y | U | V | Y | U | V |
| Class A | -0.4% | 0.0% | 0.0% | -0.3% | -0.1% | -0.1% |
| Class B | -0.4% | -0.1% | -0.1% | -0.3% | -0.2% | -0.1% |
| Class C | -0.4% | -0.1% | -0.2% | -0.4% | -0.3% | -0.2% |
| Class D | -0.3% | -0.1% | -0.1% | -0.2% | -0.1% | -0.1% |
| Class E | -0.4% | 0.1% | 0.1% | -0.3% | 0.0% | 0.1% |
| **Overall** | -0.4% | 0.0% | -0.1% | -0.3% | -0.1% | -0.1% |
|  | -0.4% | 0.0% | -0.1% | -0.3% | -0.1% | -0.1% |
| Enc Time[%] | 98% | | | 98% | | |
| Dec Time[%] | 98% | | | 98% | | |

Table 2. Cross-check results for JCTVC-F269 with 3MPMs.

# Conclusions

These CE6b cross-check experiments report results which are consistent with those provided by the proponents.

# References

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