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| **Joint Collaborative Team on Video Coding (JCT-VC)**  **of ITU-T SG16 WP3 and ISO/IEC JTC1/SC29/WG11**  8th Meeting: San Jose, 1-10 Feb, 2012 | Document: JCTVC-H0440 |

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| *Title:* | **CE6.c: Cross-check of JCTVC-H0075:** **Intra mode coding simplification** | | | |
| *Status:* | Input Document to JCT-VC | | | |
| *Purpose:* | Informational | | | |
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# Abstract

This document reports the test results of C6c: Intra mode coding simplification, a modification to the intra prediction mode coding in HM based on the proposal JCTVC-G153[3] from I2R. The proposed techniques have been studied. The provided software has been checked, compiled and the results reported by the proponents can be confirmed. The additional 35 modes results in JCVC-H0075 are not covered by this cross-check report.

1. Introduction of the proposed methods

In JCTVC-G153[3], it is proposed to add the 19th candidate for 4x4 intra block and add a binary flag “**rem\_intra\_luma\_pred\_mode\_gr0**” before coding **rem\_intra\_luma\_pred\_mode**. As the result, the fix length binarization was realized for coding the remaining mode. In Geneva meeting, the bypass coding was adopted for remaining mode coding. In order to adapt to this change, the proponents proposed two variants based on the original G153 methods. In the first variant, the binary flag “**rem\_intra\_luma\_pred\_mode\_gr0**” uses the bypass coding of current HM. There is no BD rate change. In the second variant, a new context is added to code the binary flag “**rem\_intra\_luma\_pred\_mode\_gr0**”. 0.2% BD rate reduction is obtained.

# Experimental Results

Simulations were conducted following common test conditions defined in JCTVC-1000 [1]. Anchor data was generated using HM5.0 software [2]. In the released CE6.c software, two macros have been introduced to integrate the proposed methods:

* LUMA\_INTRA\_REM\_CODING
* CTX\_LUMA\_INTRA\_REM

In the first variant, CTX\_LUMA\_INTRA\_REM is set as zero to enable bypass coding. In the second variant, CTX\_LUMA\_INTRA\_REM is set as one to enable the added additional context.

Table 1. Results with Bypass coding

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **All Intra HE** | | | **All Intra LC** | | |
|  | Y | U | V | Y | U | V |
| Class A (8bit) | -0.2% | 0.0% | 0.1% | -0.1% | 0.0% | 0.1% |
| Class B | -0.1% | -0.1% | 0.0% | -0.1% | -0.1% | 0.0% |
| Class C | 0.1% | -0.1% | 0.0% | 0.1% | 0.0% | 0.0% |
| Class D | 0.1% | 0.1% | 0.0% | 0.1% | -0.1% | 0.0% |
| Class E | -0.1% | 0.1% | 0.2% | -0.1% | 0.1% | 0.1% |
| **Overall** | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
|  | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Class F | 0.1% | -0.2% | 0.0% | 0.1% | 0.0% | -0.1% |
| Enc Time[%] | 101% | | | 101% | | |
| Dec Time[%] | 100% | | | 100% | | |

Table 2. Results with additional context

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **All Intra HE** | | | **All Intra LC** | | |
|  | Y | U | V | Y | U | V |
| Class A (8bit) | -0.3% | -0.1% | 0.0% | -0.3% | -0.1% | 0.0% |
| Class B | -0.2% | -0.1% | -0.1% | -0.2% | -0.1% | 0.0% |
| Class C | -0.2% | -0.2% | -0.1% | -0.2% | -0.1% | -0.1% |
| Class D | -0.2% | 0.0% | -0.1% | -0.1% | -0.1% | -0.1% |
| Class E | -0.3% | -0.1% | 0.0% | -0.3% | -0.1% | 0.0% |
| **Overall** | -0.2% | -0.1% | -0.1% | -0.2% | -0.1% | -0.1% |
|  | -0.2% | -0.1% | -0.1% | -0.2% | -0.1% | -0.1% |
| Class F | -0.2% | -0.1% | -0.2% | -0.2% | -0.2% | -0.2% |
| Enc Time[%] | 101% | | | 101% | | |
| Dec Time[%] | 100% | | | 100% | | |

# References

1. Frank Bossen, “Common test conditions and software reference configurations”, JCTVC-G1000, Joint Collaborative Team on Video Coding (JCT-VC) of ITU-T VCEG and ISO/IEC MPEG, Geneva, Switzerland, Nov 2011.
2. HM 5.0 Software, <http://hevc.kw.bbc.co.uk/trac/browser/tags/HM-5.0>.
3. C. Yeo, H. Tan, Y. H. Tan, Z. Li, “Non-CE6: On intra prediction mode coding”, JCTVC-G153, Geneva, Switzerland, Nov. 2011.