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| *Title:* | **TE3: Cross-check results of test 4.2.4 on intra differential coding** | | | |
| *Status:* | Input Document to JCT-VC | | | |
| *Purpose:* | Informational | | | |
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| *Source:* | MediaTek USA Inc. | | | |

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# Abstract

This document reports the cross check results of JCTVC-L0183 [1] (TE3 subtest 4.2.4) on intra prediction based on difference coding from Vidyo and Samsung. The proposed techniques have been studied. The provided software has been checked, compiled and the results reported by the proponents can be confirmed.

1. Introduction of the proposed methods

In the JCTVC-L0183 [1] proposed intra difference coding mode, difference samples for the samples of the neighboring blocks are derived by subtracting the co-located base layer samples from the reconstructed enhancement layer samples. The intra prediction is then done using the difference samples. The final prediction signal for a block is obtained by adding the (upsampled) reconstructed base layer signal to the difference prediction signal.

The same intra prediction modes as in conventional intra prediction are used. The difference mode is signaled at CU level.

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# Experimental Results

Simulations were conducted following common test conditions defined in TE3 [3]. Anchor data was generated using SMuC0.1.1 software [2]. Results produced by current software implementation are reported in the following tables. In the JCTVC- L0183 [1] software, two macros have been introduced to integrate the proposed methods:

#define VIDYO\_TE3\_K044\_DIFF\_CODING\_TOOL\_INTER   0

#define VIDYO\_TE3\_K044\_DIFF\_CODING\_TOOL\_INTRA   1

Table 1 reports the results. All the BD rate results matched what proponent provided. Since the simulation jobs were done in computer clusters with variable CPU and memory, the encoding and decoding time is not accurate.

Table 1. Results with the proposed methods

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| --- | --- | --- | --- | --- | --- | --- |
|  | **AI HEVC 2x** | | | **AI HEVC 1.5x** | | |
|  | Y | U | V | Y | U | V |
| Class A | -0.6% | -0.5% | -0.7% |  |  |  |
| Class B | -1.1% | -0.5% | -0.7% | -0.6% | 0.0% | -0.1% |
| **Overall (EL+BL)** | -0.9% | -0.5% | -0.7% | -0.6% | 0.0% | -0.1% |
| **Overall (EL)** | -1.6% | -0.9% | -1.2% | -1.6% | 0.2% | -0.2% |
| Enc Time[%] | 188.8% | | | 165.4% | | |
| Dec Time[%] | 141.3% | | | 132.5% | | |
| Enc Mem[%] | #DIV/0! | | | #DIV/0! | | |
| BL Match | Matched | | | Matched | | |

# References

1. W. Jang, J. Boyce, A. Abbas, E. Alsina, C. Kim,“ TE3: Results of test 4.2.4 on intra prediction based on difference coding,” Document of Joint Collaborative Team on Video Coding, JCTVC-L0183, Jan, 2013.
2. SMuC0.1.1 Software, <https://hevc.hhi.fraunhofer.de/svn/svn_SMuCSoftware/branches/0.1.1-bugfix>.
3. X. Li, et.al, “Description of Tool Experiment B3: Combined Prediction in SHVC,” JCTVC-K1103, Shanghai, China, Oct. 2012.