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| **Joint Collaborative Team on Video Coding (JCT-VC)**  **of ITU-T SG16 WP3 and ISO/IEC JTC1/SC29/WG11**  11th Meeting: Shanghai, China, October 10-19, 2012 | Document: JCTVC-K0104  M26388 |

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| *Title:* | **Cross-verification of JCTVC-K0101 on Line Buffer Cleanup** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Information | | |
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# Abstract

This contribution reports cross-check results of JCTVC-K0101 on line buffer cleanup. In JCTVC-K0101 it is advocated to remove the motion data line buffer down-sampling tool to resolve the design inconsistency along tile boundaries. The experiment results reported in this document match those provided by the proponents in JCTVC-K0101, the source code has been also checked to verify its consistency with the proposal description.

# Introduction

Due to restriction of having uni-prediction only for 4x8 and 8x4 PUs for motion compensation memory bandwidth reduction purpose, the motion data line buffer down-sampling has lost its original benefit of line buffer size saving as bi-pred 8x8 PUs become the worst case in terms of storage. In addition, it was indentified the current design is inconsistent along tile boundaries. JCTVC-K0101[3] proposes to remove the motion data line buffer down-sampling to address the issue. This document reports cross-check results.

# Test Settings and Conditions

The simulations of this document have used HM8.0 software, the simulation platform is LSF equipped with Intel(R) Xeon(R) CPU X5570 64 bits Linux machines of different frequencies, the common test conditions and reference configurations specified in [1] are followed

# Experimental results

The experimental results are summarized in Table 1. The results match the ones reported in JCTVC-K0101, no coding loss is observed. Please be advised the run time reported in Table 1 might not be accurate.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Random Access Main | | | Random Access HE10 | | |
|  | Y | U | V | Y | U | V |
| Class A | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% | -0.1% |
| Class B | 0.0% | 0.0% | 0.1% | 0.0% | 0.0% | 0.1% |
| Class C | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | -0.1% |
| Class D | 0.0% | -0.1% | 0.0% | -0.1% | -0.2% | -0.2% |
| Class E |  |  |  |  |  |  |
| **Overall** | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | -0.1% |
|  | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | -0.1% |
| Class F | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 98% | | | 104% | | |
| Dec Time[%] | 96% | | | 105% | | |
|  |  | | |  | | |
|  | **Low delay B Main** | | | **Low delay B HE10** | | |
|  | Y | U | V | Y | U | V |
| Class A |  |  |  |  |  |  |
| Class B | 0.0% | 0.3% | -0.1% | 0.0% | 0.0% | 0.0% |
| Class C | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Class D | -0.1% | 0.2% | -0.4% | 0.0% | -0.1% | -0.3% |
| Class E | 0.1% | 0.0% | 0.7% | 0.0% | 0.3% | -0.1% |
| **Overall** | 0.0% | 0.1% | 0.0% | 0.0% | 0.0% | -0.1% |
|  | 0.0% | 0.1% | 0.0% | 0.0% | 0.0% | -0.2% |
| Class F | 0.0% | 0.0% | 0.0% | -0.1% | 0.0% | -0.3% |
| Enc Time[%] | 99% | | | 102% | | |
| Dec Time[%] | 98% | | | 103% | | |
|  |  | | |  | | |
|  | **Low delay P Main** | | | **Low delay P HE10** | | |
|  | Y | U | V | Y | U | V |
| Class A |  |  |  |  |  |  |
| Class B | 0.0% | 0.0% | 0.6% | 0.0% | 0.1% | -0.4% |
| Class C | 0.0% | 0.0% | 0.2% | 0.0% | -0.1% | -0.1% |
| Class D | 0.0% | 0.6% | -0.1% | 0.1% | -1.0% | 0.0% |
| Class E | 0.0% | 0.4% | -0.5% | 0.1% | -0.5% | 0.5% |
| **Overall** | 0.0% | 0.2% | 0.1% | 0.0% | -0.3% | 0.0% |
|  | 0.0% | 0.2% | 0.1% | 0.0% | -0.3% | -0.1% |
| Class F | 0.0% | 0.3% | 0.4% | -0.1% | -0.1% | 0.0% |
| Enc Time[%] | 102% | | | 102% | | |
| Dec Time[%] | 103% | | | 101% | | |

**Table 1. BD-rate difference (%) of removing motion data line buffer down-sampling w.r.t. HM8.0**

# Comments

As there is no actual benefit of keeping the motion data line buffer down-sampling in the design, it is beneficial to remove this tool to resolve the design inconsistency issue along tile boundaries.

# References

[1] F. Bossen, “Common test conditions and software reference configurations,” JCT-VC Document, JCTVC-J1100, Stockholm, Sweden, July 2012.

[2] [B. Bross](mailto:benjamin.bross@hhi.fraunhofer.de), [W.-J. Han](mailto:wjhan.han@samsung.com), [J.-R. Ohm](mailto:ohm@ient.rwth-aachen.de), [G. J. Sullivan](mailto:garysull@microsoft.com), [T. Wiegand](mailto:thomas.wiegand@hhi.fraunhofer.de) “High Efficiency Video Coding (HEVC) Test Model 8 (HM 8) Encoder Description” JCT-VC Document, JCTVC-J1003, Stockholm, Sweden, July 2012.

[3] [P. Kapsenberg](mailto:pieter.kapsenberg@intel.com), [W. Zhang](mailto:wenhao.zhang@intel.com), “Line Buffer Cleanup,” JCT-VC Document, JCTVC-K0101, 11th Meeting, Shanghai, China, 10–19 October 2012