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| **Joint Collaborative Team on Video Coding (JCT-VC)**  **of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11**  18th Meeting: Sapporo, JP, 30 June – 9 July 2014 | Document: JCTVC-R0171 |

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| *Title:* | **SCCE1: Crosscheck report of SCCE1 test 2.3 Merge mode** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Proposal | | |
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# Abstract

This documents reports the crosscheck results for SCCE1 test 2.3 on IntraBC merge mode (JCTVC-R0097). The source code provided by the proponents was verified to be consistent with the description in JCTVC-Q1121. The rate-distortion performance was evaluated for SCCE1 test conditions JCTVC-Q1121 and matches the one provided in JCTVC-R0097.

# Introduction

JCTVC-R0097 [2] describes a technique where an improved palette table generation method is used to derive the palette table for palette mode coding. IBC skip mode means 2N×2N partition IBC mode without residue. A flag is signaled for each CU to indicate the usage of the IBC skip mode. More details of this technique can be found in JCTVC-R0097.

# Simulation results

The performance of the SCCE1 test 2.3 is evaluated according to SCCE1 test conditions [1] and is summarized below. The detailed results can be found in the attached excel datasheets.

Table 1. Average BD rate reduction for lossless coding compared with SCCE1 full frame IntraBC anchors

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **All Intra** | | | |
|  | Bit-rate saving (Total) | Bit-rate saving (Average) | Bit-rate saving (Min) | Bit-rate saving (Max) |
|  |
| RGB, text & graphics with motion, 1080p | 5.6% | 5.6% | 4.8% | 7.0% |
| RGB, text & graphics with motion,720p | 1.1% | 1.7% | 0.6% | 3.6% |
| RGB, mixed content, 1440p | 2.1% | 1.9% | 0.9% | 2.9% |
| RGB, mixed content, 1080p | 2.1% | 2.1% | 2.1% | 2.1% |
| RGB, Animation, 720p | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB, camera captured, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | 5.4% | 5.4% | 4.2% | 7.0% |
| YUV, text & graphics with motion,720p | 1.1% | 1.8% | 0.5% | 4.5% |
| YUV, mixed content, 1440p | 2.1% | 1.9% | 1.0% | 2.9% |
| YUV, mixed content, 1080p | 1.8% | 1.8% | 1.8% | 1.8% |
| YUV, Animation, 720p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, camera captured, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 116% | | | |
| Dec Time[%] | 101% | | | |
|  |  |  |  |  |
|  | **Random Access** | | | |
|  | Bit-rate saving (Total) | Bit-rate saving (Average) | Bit-rate saving (Min) | Bit-rate saving (Max) |
|  |
| RGB, text & graphics with motion, 1080p | 3.8% | 3.9% | 2.3% | 5.6% |
| RGB, text & graphics with motion,720p | 0.3% | 0.9% | 0.2% | 2.8% |
| RGB, mixed content, 1440p | 0.4% | 0.4% | 0.1% | 0.8% |
| RGB, mixed content, 1080p | 0.4% | 0.4% | 0.4% | 0.4% |
| RGB, Animation, 720p | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB, camera captured, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | 3.8% | 3.8% | 1.9% | 5.6% |
| YUV, text & graphics with motion,720p | 0.3% | 1.1% | 0.2% | 3.5% |
| YUV, mixed content, 1440p | 0.4% | 0.4% | 0.1% | 0.8% |
| YUV, mixed content, 1080p | 0.4% | 0.4% | 0.4% | 0.4% |
| YUV, Animation, 720p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, camera captured, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 112% | | | |
| Dec Time[%] | 107% | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  | **Low Delay B** | | | |
|  | Bit-rate saving (Total) | Bit-rate saving (Average) | Bit-rate saving (Min) | Bit-rate saving (Max) |
|  |
| RGB, text & graphics with motion, 1080p | 3.9% | 3.4% | 1.8% | 4.4% |
| RGB, text & graphics with motion,720p | 0.2% | 0.3% | 0.1% | 0.9% |
| RGB, mixed content, 1440p | 0.2% | 0.2% | 0.0% | 0.5% |
| RGB, mixed content, 1080p | 0.2% | 0.2% | 0.2% | 0.2% |
| RGB, Animation, 720p | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB, camera captured, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | 3.7% | 3.3% | 1.6% | 4.3% |
| YUV, text & graphics with motion,720p | 0.2% | 0.4% | 0.1% | 1.1% |
| YUV, mixed content, 1440p | 0.2% | 0.2% | 0.0% | 0.4% |
| YUV, mixed content, 1080p | 0.1% | 0.1% | 0.1% | 0.1% |
| YUV, Animation, 720p | 0.0% | 0.0% | 0.0% | 0.0% |
| YUV, camera captured, 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 109% | | | |
| Dec Time[%] | 106% | | | |

Table 2. Average BD rate reduction for lossy coding compared with SCCE1 full frame IntraBC anchors

|  |  |  |  |
| --- | --- | --- | --- |
|  | **All Intra** | | |
|  | G/Y | B/U | R/V |
| RGB, text & graphics with motion, 1080p | -7.2% | -7.3% | -7.3% |
| RGB, text & graphics with motion,720p | -4.0% | -4.2% | -4.2% |
| RGB, mixed content, 1440p | -2.9% | -2.9% | -2.9% |
| RGB, mixed content, 1080p | -2.9% | -2.9% | -2.9% |
| RGB, Animation, 720p | -0.1% | -0.1% | -0.1% |
| RGB, camera captured, 1080p | 0.0% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | -7.4% | -7.6% | -7.5% |
| YUV, text & graphics with motion,720p | -4.3% | -4.5% | -4.7% |
| YUV, mixed content, 1440p | -3.1% | -3.2% | -3.2% |
| YUV, mixed content, 1080p | -3.2% | -3.3% | -3.3% |
| YUV, Animation, 720p | -0.2% | -0.2% | -0.2% |
| YUV, camera captured, 1080p | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 116% | | |
| Dec Time[%] | 99% | | |
|  |  |  |  |
|  | **Random Access** | | |
|  | G/Y | B/U | R/V |
| RGB, text & graphics with motion, 1080p | -4.3% | -4.2% | -4.3% |
| RGB, text & graphics with motion,720p | -2.7% | -2.7% | -2.8% |
| RGB, mixed content, 1440p | -1.8% | -1.7% | -1.7% |
| RGB, mixed content, 1080p | -1.9% | -2.0% | -1.9% |
| RGB, Animation, 720p | -0.1% | -0.1% | 0.0% |
| RGB, camera captured, 1080p | 0.0% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | -4.4% | -4.4% | -4.5% |
| YUV, text & graphics with motion,720p | -2.8% | -2.7% | -2.8% |
| YUV, mixed content, 1440p | -1.9% | -2.1% | -2.0% |
| YUV, mixed content, 1080p | -2.3% | -2.4% | -2.1% |
| YUV, Animation, 720p | -0.1% | -0.2% | 0.0% |
| YUV, camera captured, 1080p | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 108% | | |
| Dec Time[%] | 103% | | |
|  |  |  |  |
|  | **Low delay B** | | |
|  | G/Y | B/U | R/V |
| RGB, text & graphics with motion, 1080p | -3.3% | -3.2% | -3.2% |
| RGB, text & graphics with motion,720p | -1.0% | -1.0% | -0.9% |
| RGB, mixed content, 1440p | -1.0% | -1.2% | -1.0% |
| RGB, mixed content, 1080p | -1.3% | -1.1% | -1.3% |
| RGB, Animation, 720p | 0.0% | -0.1% | 0.0% |
| RGB, camera captured, 1080p | 0.0% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | -3.2% | -3.3% | -3.3% |
| YUV, text & graphics with motion,720p | -1.2% | -1.1% | -0.8% |
| YUV, mixed content, 1440p | -1.2% | -1.5% | -1.5% |
| YUV, mixed content, 1080p | -0.8% | -1.7% | -0.5% |
| YUV, Animation, 720p | -0.1% | -0.3% | -0.4% |
| YUV, camera captured, 1080p | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 107% | | |
| Dec Time[%] | 108% | | |

# References

1. J. Sole, S. Liu, “HEVC Screen Content Coding Core Experiment 1 (SCCE1): Intra Block Copying Extensions”, JCTVC-Q1121, Apr. 2014.
2. B. Li, J. Xu, “SCCE1: Crosscheck report of SCCE1 test 2.3 Merge mode”, JCTVC-R0097, Jul. 2014.