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| *Title:* | **Cross-check of JCTVC-J0309 on removal of last significant coefficient position coding in transform skip** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Report | | |
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# Abstract

This contribution reports the results of a cross-check of JCTVC-J0309, which proposed the removal of last significant coefficient position coding for 4x4 intra TUs when coded with transform skip mode. The simulation results reportedly matched those provided by the proponents.

# Introduction

In JCTVC-J0309 [2], it is proposed to remove the signalling of the position of the last coefficient when transform skip mode is used for 4x4 intra TUs. Instead, the position of the last significant coefficient is assumed to be (3,3).

The source code was reviewed and found to match the proposed modification. In particular, when a 4x4 TU is coded with transform skip, the signalling of the position of the last significant coefficient is skipped, and the position is assumed to be (3,3). Furthermore, the coefficient at (3,3) is not assumed to be significant, and a significant coefficient flag also needs to be sent (in contrast, in HM7.0, it is assumed that the coefficient at the last significant coefficient position is significant, and so no significant coefficient flag needs to be sent).

# Simulation results

We have tested the modification in common conditions [3] for All-Intra HE10, Random Access HE10 and Low-Delay B HE10, as these are the cases in common conditions where transform skip is used.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **All Intra HE10** | | |
|  | Y | U | V |
| Class A | 0.0% | 0.0% | 0.0% |
| Class B | 0.0% | 0.0% | 0.0% |
| Class C | 0.0% | 0.0% | 0.0% |
| Class D | 0.1% | 0.1% | 0.0% |
| Class E | 0.0% | 0.0% | 0.0% |
| **Overall** | 0.0% | 0.0% | 0.0% |
|  | 0.0% | 0.0% | 0.0% |
| Class F | -0.3% | -0.5% | -0.3% |
| Enc Time[%] | 100% | | |
| Dec Time[%] | 101% | | |
|  |  |  |  |
|  | **Random Access HE10** | | |
|  | Y | U | V |
| Class A | 0.1% | 0.1% | -0.1% |
| Class B | 0.0% | 0.0% | 0.0% |
| Class C | 0.0% | 0.1% | -0.3% |
| Class D | 0.0% | -0.2% | -0.3% |
| Class E |  |  |  |
| **Overall** | 0.0% | 0.0% | -0.2% |
|  | 0.0% | 0.0% | -0.2% |
| Class F | -0.1% | -0.2% | -0.3% |
| Enc Time[%] | 100% | | |
| Dec Time[%] | 99% | | |
|  |  |  |  |
|  | **Low delay B HE10** |  |  |
|  | Y | U | V |
| Class A |  |  |  |
| Class B | 0.0% | 0.1% | 0.1% |
| Class C | 0.0% | -0.1% | 0.1% |
| Class D | 0.0% | 0.5% | -0.1% |
| Class E | 0.1% | -0.7% | -0.3% |
| **Overall** | 0.0% | 0.0% | 0.0% |
|  | 0.0% | 0.0% | 0.0% |
| Class F | 0.0% | 0.3% | 0.8% |
| Enc Time[%] | 100% | | |
| Dec Time[%] | 99% | | |

# Conclusions

We have performed a cross-check of the modification proposed in JCTVC-J0309. The simulation results match those provided by the proponent.

# References

[1] B. Bross et al., “High efficient video coding (HEVC) text specification draft 7,” in JCTVC-I1003\_d6, Geneva, CH, May 2012.

[2] K. Panusopone et al., “Removal of last coefficient coding in transform skipping mode,” in JCTVC-J0309, Stockholm, SE, Jul 2012.

[3] F. Bossen, “Common HM test conditions and software reference configurations,” in JCTVC-I1100, Geneva, CH, May 2012.