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| *Title:* | **CE4 Subtest 1: signaling of minCUDQPSize at LCU level per JCTVC-E436** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Information | | |
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# Abstract

The contribution presents an independent cross-check of CE4 Subtest1, which is an investigation of the JCTVC-E436 proposal on signaling minCUDQPSize at the LCU level.

# Introduction

JCTVC-E436 [1] proposed two methods of signaling the spatial granularity at which QP can change. One method, which was adopted into HM 3.0, is to signal minCUDQPSize at the PPS level. This method is referred to as the anchor or reference method. The other method is to signal at the LCU level, which we refer to as the target method. We present simulation results comparing these two methods.

# Simulation Results

Simulation results for the anchor were initially generated using HM-3.0-dev-r863-CE4, which was distributed to CE4 participants on May 13, 2011. When a revised version HM-3.0-dev-r863-CE4\_r2 was released we decided to stop the anchor simulation runs with only AI-LC configuration remaining. Instead of restarting the simulation runs for the anchor, we chose to simulate the target method. Because the revised version of the software introduced minor RD differences, we decided to use the anchor data, with exception of run times, provided by HKUST [2] instead. For the run times, we used our anchor data which lacks data only for the AI-LC configuration. The BD-rate results match those of HKUST [2].

Table : BD-Rate Data

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| |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | All Intra HE | | | | All Intra LC | | | | | Y | U | V | dQP incr. | Y | U | V | dQP incr. | | Class A | 0.13 | 0.09 | 0.15 | 6.5% | 0.18 | 0.18 | 0.19 | 9.1% | | Class B | 0.13 | 0.14 | 0.12 | 4.1% | 0.15 | 0.14 | 0.14 | 4.9% | | Class C | 0.03 | 0.03 | 0.03 | 0.9% | 0.05 | 0.05 | 0.05 | 1.4% | | Class D | 0.03 | 0.03 | 0.03 | 0.8% | 0.03 | 0.03 | 0.03 | 1.0% | | Class E | 0.21 | 0.27 | 0.22 | 4.4% | 0.23 | 0.23 | 0.23 | 5.0% | | All | 0.10 | 0.11 | 0.11 | 3.3% | 0.13 | 0.12 | 0.12 | 4.3% | | Enc Time[%] | 102% | | | | N/A | | | | | Dec Time[%] | 102% | | | | N/A | | | | |  |  |  |  |  |  |  |  |  | |  | Random Access HE | | | | Random Access LC | | | | | Y | U | V | dQP incr. | Y | U | V | dQP incr. | | Class A | 0.37 | 0.35 | 0.35 | 14.7% | 0.56 | 0.57 | 0.56 | 18.7% | | Class B | 0.35 | 0.25 | 0.44 | 9.7% | 0.42 | 0.41 | 0.39 | 11.5% | | Class C | 0.26 | 0.29 | 0.25 | 6.4% | 0.28 | 0.28 | 0.28 | 6.9% | | Class D | 0.18 | 0.10 | 0.22 | 4.4% | 0.16 | 0.16 | 0.17 | 4.4% | | Class E |  |  |  |  |  |  |  |  | | All | 0.29 | 0.25 | 0.32 | 8.8% | 0.36 | 0.36 | 0.35 | 10.5% | | Enc Time[%] | 103% | | | | 102% | | | | | Dec Time[%] | 105% | | | | 105% | | | | |  |  |  |  |  |  |  |  |  | |  | Low delay B HE | | | | Low delay B LC | | | | | Y | U | V | dQP incr. | Y | U | V | dQP incr. | | Class A |  |  |  |  |  |  |  |  | | Class B | 0.54 | 0.39 | 0.29 | 13.2% | 0.67 | 0.64 | 0.62 | 15.1% | | Class C | 0.36 | 0.45 | 0.38 | 8.2% | 0.42 | 0.42 | 0.42 | 8.9% | | Class D | 0.22 | 0.37 | 0.89 | 5.6% | 0.24 | 0.25 | 0.25 | 5.6% | | Class E | 0.92 | 0.66 | 2.19 | 17.9% | 1.07 | 1.08 | 1.07 | 19.6% | | All | 0.49 | 0.45 | 0.82 | 10.9% | 0.58 | 0.57 | 0.56 | 12.0% | | Enc Time[%] | 103% | | | | 102% | | | | | Dec Time[%] | 103% | | | | 102% | | | | |

The results indicate that the target method underperforms the anchor with a luma coding loss that varies between 0.1% for AI-HE to 0.58% for LB-LC.

# References

1. C. Pang, et. al., “Sub-LCU QP representation,” JCT-VC Document, JCTVC-E436, Geneva, March 2011.
2. C. Pang, et. al., “CE4 Subtest1: the signaling of minCUDQPsize at LCU level,” JCT-VC Document, JCTVC-F221, Torino, July 2011.