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| *Title:* | Cross-check report for JCTVC-G374 on improving intra prediction | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Report | | |
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# Abstract

JCTVC-G374 aims to improve intra prediction by either using a different set of angle parameters for angular intra prediction or switching between angle parameters for angular intra prediction. This contribution presents the results and observations from the experiments performed by the Institute for Infocomm Research. The coding results obtained reportedly match what was provided by the proponents.

# Introduction

In HM4, the following tables are used for scaling the angle parameter to the different block sizes:

Int angTable[9] = {0, 2, 5, 9, 13, **17**, **21**, **26**, 32}

Int invAngTable[9] = {0, 4096, 1638, 910, 630, **482**, **390**, **315**, 256}

JCTVC-G374 proposes the replacement of the above tables with the following tables:

Int angTable[9] = {0, 2, 5, 9, 13, **18**, **23**, **28**, 32}

Int invAngTable[9] = {0, 4096, 1638, 910, 630, **455**, **356**, **293**, 256}

Two cases are proposed. In Case 1, the original tables are replaced with the proposed tables. In Case 2, both the original HM4 angle parameter table and the new angle parameter table are present, and the table to be used depends on the intra prediction mode of the neighboring prediction units (PU).

If both the left neighboring and above neighboring PUs are either not available or not intra coded, then the new set of proposed angle parameters is used. If either or both neighboring PUs are available and intra coded, which table to be used depends on the entries of a look-up table indexed by the intra prediction mode of the neighboring PUs. The original set of HM4 angle parameters is used only when the entries for both the left and above intra prediction mode are 0.

# Simulation Results

The proposed modifications were made in HM4. Tests were conducted using the two All-Intra configurations, i.e. high-efficiency and low complexity, following the common testing conditions [5].

Table 1 and 2 show the results of Case 1 and 2 respectively.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **All Intra HE** | | | **All Intra LC** | | |
|  | Y | U | V | Y | U | V |
| Class A | 0.1% | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% |
| Class B | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% |
| Class C | -0.2% | -0.2% | -0.2% | -0.2% | -0.2% | -0.3% |
| Class D | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Class E | 0.1% | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% |
| **Overall** | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
|  | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 100% | | | 100% | | |
| Dec Time[%] | 98% | | | 98% | | |

Table 1. Cross-check results for Case 1.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **All Intra HE** | | | **All Intra LC** | | |
|  | Y | U | V | Y | U | V |
| Class A | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Class B | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Class C | -0.2% | -0.1% | -0.2% | -0.2% | -0.2% | -0.2% |
| Class D | 0.0% | -0.1% | -0.1% | 0.0% | 0.0% | 0.0% |
| Class E | 0.0% | -0.1% | 0.0% | 0.0% | 0.0% | 0.0% |
| **Overall** | 0.0% | -0.1% | 0.0% | 0.0% | 0.0% | 0.0% |
|  | 0.0% | -0.1% | -0.1% | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 101% | | | 101% | | |
| Dec Time[%] | 99% | | | 98% | | |

Table 2. Cross-check results for Case 2.

# Conclusions

We have carried out cross-checks of the proposal in JCTVC-G374, and experimental results obtained are consistent with those provided by the proponents.

# References

1. L. Liu, “Improving the Intra Prediction based on a Uniform Probability Model,” JCTVC-G374, Geneva, CH, Nov., 2011.
2. F. Bossen, “Common conditions and software reference configurations,” JCTVC-F900, Torino, Italy, Jul., 2011.