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| *Title:* | **Description of Core Experiment 1 (CE1) on Residual Prediction** | | |
| *Status:* | Output Document | | |
| *Purpose:* | Core Experiment Description | | |
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# Abstract

This document defines Core Experiment (CE) 1 on residual prediction to be performed for the 9th JCT-3V meeting.

# Introduction

The goal of this CE is to investigate the methods for advanced residual prediction (ARP) proposed at the 8th JCT-3V meeting. Tools under test will be evaluated according to their impact on both compression efficiency and implementation complexity.

# Participants

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# Tools under investigation

## Further improvements on advanced residual prediction [JCT3V-H0130]

It is proposed to extend the block-level temporal ARP (when sub-PU inter-view merging candidates are used) to inter-view ARP. Meanwhile, for the block-level temporal ARP, the disparity vector refinement process is also applied to further improve the coding efficiency.

Only the aspect in block-level inter-view ARP is to be further studied in this CE.

## Simplification of Advanced Residual Prediction [JCT3V-H0132]

Two aspects are proposed in this contribution:

1. Reduction of number of accessed blocks for bi-predictively coded PUs in ARP:
   1. When both the directions are coded as inter-view ARP, the number of additional blocks to be accessed is reduced from four to three.
   2. When one prediction direction is coded as temporal ARP and the other prediction direction is coded as inter-view ARP, the number of additional blocks to be accessed is reduced from four to one or three.
2. It is proposed to disable bi-predictive 4x4 chroma blocks with ARP mode by applying uni-prediction corresponding to reference picture list 0.

## Simplification of Advanced Residual Prediction [JCT3V-H0063]

It is proposed to disable ARP for 4x4 chroma blocks to reduce ARP’s bandwidth.

# Mandates

Mandates for the CE are as follows:

* To study the coding efficiency improvement and compleixty issues as in JCT3V-H0063, JCT3V-H0130 and JCT3V-H0132 in 3D-HEVC.
* To check the complexity and coding performance of the combinations of the above techinques.

# Software, Configuration and Evaluation

## Software

Experiments in CE 1 will use the HTM version 11.0 software that is recommended in JCT3V-H1100. Proponents are requested to provide software that can be compiled under Windows and Linux platforms.

## Test Sequences, Bit Rates and Coding Conditions

The CE will use the test sequences, configuration and conditions that are recommended in JCT3V-H1100.

## Evaluation of CE Results

The performance measurements are evaluated by switching on and off individual tools to identify their relative performance. The following measurements are considered to be used in this core experiment.

* **Coding Performance Measurements:** Measure impact on bitrate/PSNR. PSNR shall be calculated for the decoded texture views, relative to original texture views and for the synthesized views relative to uncompressed synthesized views. Use 4-point BD-PSNR and BD-Rate according to common conditions. The anchors will be generated according to common test conditions.
* **Memory bandwidth Measurement:** worst case of memory bandwidth compared to HEVC shall be measured using the template provided in AHG7.

# Timelines

2014/04/25 Release HTM version 11.0

2014/06/19 Make source code, simulation results and draft text available for all proponents and cross-checkers

2014/06/26 Register and upload documents for the 9th JCT-3V meeting