

**Title:** JCT-3V AHG report: MV-HEVC / 3D-HEVC Test Model editing (AHG3)

**Status:** AHG report input to JCT-3V

**Purpose:** AHG report

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**Source:** AHG

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## Abstract

This document reports on the work of the JCT-3V ad hoc group on MV-HEVC / 3D-HEVC Test Model editing (AHG3) between the 2<sup>nd</sup> JCT-3V meeting in Shanghai (13-19 October 2012) and the 3<sup>rd</sup> meeting in Geneva (17-23 January 2013).

## 1 Mandates

Title and Email Reflector	Chairs	Mtg
<p><b>MV-HEVC / 3D-HEVC Test Model editing (AHG3)</b></p> <p>(jct-3v@lists.rwth-aachen.de)</p> <ul style="list-style-type: none"> <li>Produce and finalize JCT3V-B1005 3D-HEVC Test Model Description draft 2.</li> <li>Produce and finalize JCT3V-B1004 MV-HEVC text specification draft 2.</li> <li>Gather and address comments for refinement of these documents.</li> <li>Coordinate with the 3D-HEVC Software Integration AhG to address issues relating to mismatches between software and text.</li> <li>Set up a bug tracking system.</li> </ul>	<p>G. Tech</p> <p>K. Wegner (co-chairs)</p> <p>Y. Chen</p> <p>T. Suzuki</p> <p>S. Yea</p> <p>J.-R. Ohm</p> <p>G. Sullivan (vice chairs)</p>	N

## 2 Background

The second MV-HEVC working draft and the second 3D-HEVC Test Model were developed from the first MV-HEVC working draft and the first 3D-HEVC Test Model following the decisions taken at the 2<sup>nd</sup> JCT-3V meeting in Shanghai (13-19 October 2012).

## 3 Method of Working

Two editorial teams were formed to work on the two documents that were to be produced:

- JCT3V-B1004 MV-HEVC Working Draft 2 [1]
  - Gerhard Tech
  - Krzysztof Wegner
  - Ying Chen
  - Miska Hannuksela
- JCT3V-B1005 3D-HEVC Test Model 2 [2]
  - Gerhard Tech
  - Krzysztof Wegner
  - Ying Chen
  - Sehoon Yea

Editing JCT3V-B1004 was assigned a higher priority than editing JCT3V-B1005.

## 4 Status

### 4.1 *MV-HEVC Working Draft*

One version of JCT3V-B1004 was published by the AHG following the 2<sup>nd</sup> JCT-3V meeting in Shanghai.

The major changes in the MV-HEVC working draft JCT3V-B1004 relative to the JCT3V-A1004 are:

Normative changes

- (MVN-01/JCT3V-B0063) Incorporated view dependency change SEI.

Editorial changes:

- (MVE-06) Incorporated introductory paragraph for view dependency change SEI message.
- (MVE-05) Incorporated invocation of sub-bitstream extraction process in general decoding process
- (MVE-04) Fixed construction of layerId list in general decoding process
- (MVE-03) Replacement of changes marks related to base spec by highlighting
- (MVE-02) Incorporated initial version of HRD text.
- (MVE-01/JCT3V-B00046) Incorporated editorial note.

Open issues in JCT3V-B1004 that need discussion:

- Mismatches to HTM-5.1 software exist since MV-HEVC working draft is based on HEVC text specification 8 [3] and HTM-5.1 is based on HM-6.1 software.

## 4.2 3D-HEVC Test Model

One version of JCT3V-B1005 was published by the editing AHG following the 2<sup>nd</sup> JCT-3V meeting in Shanghai.

All adoptions of the last meeting have been incorporated. Moreover all existing and new text has been revised and improved. The total number of pages of the document increased from 82 to 119.

Changes of JCT3V-B1005 relative to JCT3V-A1005 are:

Normative changes (Adoptions):

- (3DN-01/[JCT3V-B0045](#)) Illumination compensation for inter-view prediction.
- (3DN-12/[JCT3V-B0036](#)) Simplified Depth Coding with an optional Depth LUT
- (3DN-13/[JCT3V-B0039](#)) Simplified Wedgelet search for DMM modes 1 and 3
- (3DN-03/[JCT3V-B0083](#)) Unconstrained motion parameter inheritance
- (3DN-02/[JCT3V-B0068](#)) Incorporated Depth Quadtree Prediction.
- (3DN-09-10-11/[JCT3V-B0048](#),[B0069](#),[B0086](#)) Modification inter-view merge candidates
- (3DN-04/[JCT3V-B0047](#)) Improvements for disparity vector derivation)
- (3DN-08/[JCT3V-B0136](#)) Support of parallel merge in disparity vector derivation
- (3DN-05/[JCT3V-B0135](#)) Modified disparity vector derivation process for memory reduction
- (3DN-04/[JCT3V-B0111](#)) Decoupling inter-view candidate for AMVP
- (3DN-07/[JCT3V-B0096](#)) Removal of dependency between multiple PUs in a CU for DV-derivation\_
- (MVS-02/[JCT3V-B0046](#)) Treatment of inter-view pictures as long term- reference pictures

Normative changes ( Adoptions of former meetings):

- (3Dn-02/[m24766](#)) Restricted Inter-View Residual Prediction
- (3Dn-01/[m23639](#)) Results on motion parameter prediction

Non-normative changes:

- (3DO-01/[JCT3V-B0131](#)) Depth distortion metric with a weighted depth fidelity term

Editorial changes:

- (3DE-11) Revised text related to 3Dn-01
- (3DE-12) Revised text related to residual prediction
- (3DE-10) Revised text related to illumination compensation.
- (3DE-09) Revised text related to depth intra: Edge Intra
- (3DE-09) Revised text related to depth intra: SDC
- (3DE-09) Revised text related to depth intra: DMMs
- (3DE-08) Incorporated context tables for SDC
- (3DE-07) Improved MPI text.
- (3DE-06) Incorporated parsing process, including tables for DMMs.
- (3DE-05) Added missing initialization of invalid motion/disparity parameters
- (3DE-04) Moved pruning of spatial merge candidate B2 due to number of total candidates.
- (3DE-03) Moved derivation of disparity one level higher in process hierarchy.
- (3DE-02) Inserted "Derivation process for motion vector components and ref indices" from base spec
- (3DE-01) Revised derivation of disparity from temporal candidates

Fixes:

- (3DC-03) Added missing pruning of collocated merge candidate due to number of total candidates.
- (3DC-02) Fixed storage of IvpMvFlagLX and IvpMvDisp.
- (3DC-01) Fixed derivation of inter-view merge candidates.

Open issues in JCT3V-A1005 that need discussion:

- Mismatches to HTM-5.1 software exist since the 3D-HEVC “normative” Annex G is based on HEVC text specification 8 [3] and HTM-5.1 software is based on HM-6.1.
- With the adoption of tools related to inter-view motion prediction (JCT3V-A0126, JCT3V-A0049, JCT3V-A0097) the issue arose that inter-view motion prediction is reasonably specified for CTC only. Moreover there are mismatches between provided software and text.
- The Test Model includes tools not integrated in software.

## 5 Setup of bug tracking system

The setup of the bug tracking system is pending. It is targeted to unify it with current JCT-VC system. Since the host of the system will change, the JCT-3V system can be set up only after the migration of the JCT-VC system.

## 6 Recommendations

The recommendations of the MV-HEVC / 3D-HEVC Test Model editing are to:

- Approve the edited JCT3V-B1004 and JCT3V-B1005 documents as JCT-3V outputs
- Continue to edit both documents to ensure that all agreed elements of 3D- and MV-HEVC are fully described
- Setup and use an issue tracker to facilitate the reporting of issues with the text of either document
- Compare the documents with the HTM-software and resolve any discrepancies that may exist, in collaboration with the Software AHG
- Continue to improve the overall editorial quality of the MV-HEVC working draft 3D-HEVC test model description
- Ensure that properly drafted candidate text for both the MV-HEVC working draft and the 3D - HEVC Test Model (if appropriate) is available prior to making any decision to change the MV-HEVC or 3D-HEVC specification
- To split further version of the 3D-HEVC test model document in two files: One containing the test model description and one containing working draft text of Annex G.
- Discuss reported open issues.

## 7 References

- [1] JCT-3V, “MV-HEVC Working Draft 2”, JCT3V-B1004, JCT-3V Meeting, Shanghai, October 2012
- [2] JCT-3V, “3D-HEVC Test Model 2”, JCT3V-B1005, JCT-3V Meeting, Shanghai, October 2012
- [3] JCT-VC, “High Efficiency Video Coding (HEVC) text specification draft 8”, JCTVC-J1003, JCT-VC Meeting, Stockholm, July 2012