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**ISO/IEC JTC 1/SC 29/WG 11**

**CODING OF MOVING PICTURES AND AUDIO**

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# Abstract

This document provides a description of G-PCC Exploratory Experiment 13.43 on coordinate conversion.

# Introduction

The goal of Exploratory Experiment 13.43 is to evaluate the coordinate conversion method for LiDAR captured data. The performance of the method is evaluated in the scope of the EE 13.43, in terms of RD performance and computational complexity, on top of TMC13 release-v11.0[1].

# Mandates

The mandate for EE is as follows:

* + - * + To evaluate the coding performance of the attribute coding with the alternative coordinate conversion methods compared with the anchor

# Participants

Proponents of this EE are

| **Name** | **Company** | **E-mail address** | **Type** |
| --- | --- | --- | --- |
| Hyun-Mook Oh | LG Electronics Inc. | [hyunmook.oh@lge.com](mailto:hyunmook.oh@lge.com) | Proponent |
| David Flynn | Apple | [davidflynn@apple.com](mailto:davidflynn@apple.com) | Proponent |
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# Description

In the 131th MPEG meeting, coordinate conversion method was adopted to improve coding performance of attribute coding[3][5]. In this method, each point position distributed in the cylindrical coordinate system is converted to the rectangular coordinate system whose axis are function of the radius, the azimuthal angle, and the laser index. Given a point position (x, y, z), corresponding position in cylindrical coordinate system is derived by the followings,

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where and represent the center position of the LiDAR head and the relative position of each laser, respectively. With , the coordinate conversion is conducted as follows,

,

where represents the laser index which samples the point in the elevation angle , and the scaling parameters are derived by the largest length of point distribution of three axes divided by the length of point distribution along each axis.

## Test model, anchors and CTC

TMC13v11[1] shall be used as an anchor for these experiments. The tools to be evaluated [4][5] shall be implemented on top of TMC13v11.

The point cloud test material will be tested for the test sequences of category 3 Dynamic Acquisition.

The test will be performed based on the CTC condition [2] with the following exceptions.

‐ encoder option:

‐ spherical\_coord\_flag = 1 and lod\_neigh\_bias = 0

Parameters and configurations for TMC13v11 software will be provided by the proponents.

# Timeline:

* 2020-07-29: Expected date for release of cross-verified TMC13v11 software and anchors
* 2020-09-04: EE Software and results are released to cross-checkers
* 2020-09-18: Preliminary feedback from cross-checkers to proponents
* 2020-10-07: MPEG document upload deadline

# References

1. “*G-PCC Test Model v11*”, ISO/IEC JTC1/SC29/WG11 Doc. N19517, Online, June 2020
2. “*Common Test Conditions for PCC*” ISO/IEC JTC1/SC29/WG11 Doc. N19584, Online, June 2020
3. “*[G-PCC] [new proposal] Coordinate conversion for attribute coding of cat3-frame data*”, ISO/IEC JTC1/SC29 WG11 input document m53613, Alpbach, AT, April 2020
4. *“[GPCC] [New] EE13.40 and EE13.43 related, on fast RAHT and lossless Haar for cat3 contents with coordinate conversion”*, ISO/IEC JTC1/SC29 WG11 input document m54267, Online, June 2020
5. *“CE13.43 review of spherical co-ordinate conversion for attribute coding”*, ISO/IEC JTC1/SC29 WG11 input document m54675, Online, June 2020