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| **Title:** | **Description of Core Experiment 13.29 for G-PCC: Geometry Quantization QP Control** |

# Abstract

In this document we provide descriptions for the core experiment 13.29 on the study of geometry quantization QP control.

With the adoption of the slice-based, octree-based geometry quantization and their combination scheme [4][5], an encoder has freedom to vary QPs for slices or QPs for nodes of a given depth in a geometry octree to achieve functionalities such as rate control, subject quality optimization or region of interest quality control, etc.

The goal of this Core Experiment is to study rate distortion behaviour of geometry quantization. One way to achieve that is to obtain rate distortion curve by varying QP at slice level and compute the performance metric, i.e., D1-PSNR, D2-PSNR for geometry. In addition, we also vary QP at octree level to study the effect.

# CE 13.29 Geometry Quantization QP control

## Mandates

* Study rate distortion behaviour of geometry quantization
* Evaluate the impact of different QP to the quality of reconstructed point cloud
* Further evaluate the effects of varying QP at Octree-level.

## Participants, description of tools, and implementation notes

The following people are participating in this CE. Their specific roles are detailed in the next section.

Proponents and cross checkers are

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## Information on proposed tools

Geometry quantization will be integrated in TMC13v8 [1] and the G-PCC CD draft specification [2]. Please refer document [4][5] for details.

### Software

TMC13v8 shall be used for these experiments.

### Test configurations

Note that CTC condition will not be used. Instead we will use the following parameters:

* PositionQuantizationScale = 1
* Slice QP = 10-16, 22-28, 34-40, 46-52

### Evaluation Method

The point cloud test material will be tested for the test sequences of category

* (1) Static Objects and Scenes
* (3) Dynamic Acquisition

as defined by the CTC [3]. The following test conditions will be under evaluation

* *C2 AI, lossy geometry – (lossy attribute with fixed QP or no attribute)*

Note that the tested technologies should have an impact on geometry compression only and that attribute compression performance are reported informatively.

## CE 13.6 Coordinators

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# Timeline:

* **20219-11-01**: Expected date for TMC13v8 release;
* **2019-12-06**: Deliver results for cross check;
* **2019-12-20**: Report of preliminary cross check results;
* **2020-01-08**: MPEG document upload deadline.

# References

1. “*G-PCC Test Model 8*”, ISO/IEC JTC1/SC29/WG11 MPEG2019 Doc. w18882, Geneva, Switzerland, October 2019
2. “*Draft DoC for ISO/IEC CD 23090-9 Geometry-based Point Cloud Compression*”, ISO/IEC JTC1/SC29/WG11 MPEG2019 Doc. w18895, Geneva, Switzerland, October 2019
3. “Common Test Conditions for PCC” ISO/IEC JTC1/SC29 WG11 MPEG2018”, ISO/IEC JTC1/SC29/WG11 MPEG2019 Doc. w18883, Geneva, Switzerland, October 2019
4. “*EE13.6 report on geometry quantization”,* ISO/IEC JTC1/SC29/WG11 MPEG2019 Doc. m50924, Geneva, Switzerland, October 2019
5. “*Slice based geometry quantization”,* ISO/IEC JTC1/SC29/WG11 MPEG2019 Doc. m50927, Geneva, Switzerland, October 2019