

Institut für Geometrie

**Geometry Seminar**

7.3.2025, 9:00-10:00

Seminarraum 2 Geometrie

## **Minimal flat-injective presentations and related invariants**

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For  $n > 1$  the category of  $n$ -dim. persistence modules has wild representation type, that is, there is no simple description of indecomposable objects. Therefore, the well-known barcode invariant of 1-dim. persistence modules fails to extend to higher dimensions. An alternative for higher dimensions are the flat-injective (*flange*) presentations, which were introduced by Miller as a homological invariant of persistence modules. We give a criterion for minimality of flat-injective presentations over local graded rings, and further provide a construction procedure for finitely supported  $\mathbb{Z}^n$ -graded modules. Furthermore, we also discuss minimality of related invariants from the perspective of relative homological algebra.

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