

The canonical trace of Stanley–Reisner rings

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In this talk, I will present results from joint work [1] and [2].

In collaboration with Varbaro [1], we classify the canonical traces of Stanley–Reisner rings that are Gorenstein on the punctured spectrum, under the assumption that the ring is Cohen–Macaulay. In joint work with Kumashiro [2], we extend this classification to the non–Cohen–Macaulay setting. The key step is an explicit formula for the canonical trace of graded fiber products of Noetherian rings, which we then apply to the Stanley–Reisner rings of disconnected simplicial complexes. This reduction allows us to focus on the case of connected simplicial complexes. In that case, we are able to weaken the Cohen–Macaulay hypothesis in [1] to Serre’s condition (S_2) and obtain an analogous classification. Combining these results, we obtain a description of the canonical trace of any Stanley–Reisner ring satisfying (S_2) .

If possible, I would also like to discuss a new my conjecture about the canonical trace of Stanley–Reisner rings, as well as some aspects of an ongoing joint project.

Reference

- [1] S. Miyashita and M. Varbaro, The canonical trace of Stanley–Reisner rings that are Gorenstein on the punctured spectrum. *Int. Math. Res. Not.* 2025.12 (2025): rnaf176.
- [2] S. Kumashiro and S. Miyashita, Canonical traces of fiber products and their applications. *arXiv preprint* arXiv:2506.04899 (2025).