

SEMINARIO

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Kunz-Waldi semigroups and their Betti numbers

Abstract: Given two coprime numbers $p < q$, KW semigroups contain p, q and are contained in $\langle p, q, r \rangle$ where $2r = p, q, p + q$ whichever is even. Kunz and Waldi proved that all KW semigroups of embedding dimension $n \geq 4$ have Cohen-Macaulay type $n - 1$ and first Betti number $\binom{n}{2}$.

In this talk, we give a characterization of the KW semigroups whose defining ideal is generated by the 2×2 minors of a matrix. In addition, we identify all KW semigroups that lie on the interior of the same face of the Kunz cone $\mathcal{C}_p$ as a KW semigroup with determinantal defining ideal. Thus, we provide an explicit formula for the Betti numbers of all such semigroup rings: $\beta_0 = 1$, and $\beta_i = i \binom{n}{i+1}$ for $i = 1, \dots, n - 1$.

This talk is based on a joint work with S. Singh and H. Srinivasan.

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