
SEMINARIO

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Saturation and vanishing ideals

Abstract: We consider an homogeneous ideal I in the polynomial ring $S = \mathbb{F}_q[x_1, \dots, x_m]$ over a finite field \mathbb{F}_q and the finite set of projective rational points \mathbb{X} that it defines in the projective space \mathbb{P}^{m-1} . We concern ourselves with the problem of computing the vanishing ideal $I(\mathbb{X})$. This is usually done by adding the equations of the projective space $I(\mathbb{P}^{m-1})$ to I and computing the radical. We give an alternative and more efficient way using the saturation with respect to the homogeneous maximal ideal.

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