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Projective resolutions associated to projections. (English summary)
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Given a Cohen-Macaulay space X of dimension d, the coordinate ring $K[x]$ is a finitely generated free module over $K[x_1, \ldots, x_d]$, say with basis $\beta_1, \ldots, \beta_s$. We have the multiplication $\beta_i\beta_j$ given by $\beta_i\beta_j = \sum M_{ijk}\beta_k$, $M_{ijk} \in K[x_1, \ldots, x_d]$. Eisenbud-Riemenschneider-Schreyer used the M_{ijk} to construct a projective resolution of $K[x]$. They proved it to be minimal (after localizing) in case of minimal multiplicity. In this paper, the authors consider a projection of X to $(d+1)$-dimensional space. Then X is obtained as the normalization of the image Y generated by $\beta_1, \ldots, \beta_s$. Equations of X can be obtained now in two parts, namely linear equations and quadratic equations. The authors construct a projective resolution of $K[x]$ using these linear and quadratic equations. The interesting thing is that they prove this to be minimal (after localizing) in a case which has nothing to do with the minimal multiplicity. They suggest a condition sufficient for minimality.

Reviewed by *Gerhard Pfister*

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Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.