

Intersection Matrices and the Johnson Scheme

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In this talk we introduce a new intersection matrix $F_{sk}^t(v)(z)$ as a polynomial on variable z with matrix coefficients. The new formulation provides a uniform framework in which several intersection matrices can be extracted from $F_{sk}^t(v)(z)$. In the new framework several well-known identities on intersection matrices arise as natural consequences. As an application two new bases for the Johnson scheme are constructed and the eigenvalues of a family of intersection matrices which contains the adjacency matrices of the Johnson scheme are derived. Finally, we determine the rank of some intersection matrices. This is based on a common work with Narges Ghareghani and Ebrahim Ghorbani