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Algebraic factor analysis.

The factor analysis model is a statistical model in which observed continuous random variables are modelled as conditionally independent given fewer unobserved random variables known as factors. Underlying the model is the assumption that the random variables follow a multivariate Gaussian distribution. Hence, the parameter space of a factor analysis model is a subset of the cone of positive definite (covariance) matrices. We discuss the algebraic-geometrical structure of factor analysis that expresses itself in the model invariants, i.e. in the polynomials vanishing over the parameter space. These model invariants arise from rank conditions on a symmetric matrix under elimination of the diagonal entries of the matrix. (Received August 30, 2005)