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Sanjay Chaudhuri* (sanjay@stat.nus.edu.sg), 6 Science Drive 2, Singapore, 117546, Singapore. *Qualitative inequalities for squared partial correlations of a Gaussian random vector.*

We show that if a covariance matrix of a Gaussian random vector satisfies certain conditional independence relationships, suitable squared partial correlations can be ordered qualitatively. Such orderings are invariant over all covariance matrices satisfying the restrictive conditional independencies. These conditional independence relations can be represented by several class of Graphical Markov models. Thus these results and the knowledge of the structure of the underlying graph may be combined to postulate path based rules for comparing the degree of conditional dependence among the variables appearing in the model. We shall also discuss some algebraic properties of the postulated ordering. Potential applications of these results occur in deriving new information inequalities for Gaussian vectors, model selection, evidence gathering, methodologies for efficient searching and in various models in hydrology, among others. (Received January 29, 2009)