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Mathias Drton* (drton@uchicago.edu), Department of Statistics, University of Chicago, 5734 S. University Ave, Chicago, IL 60637, and **Josephine Yu**. *On a parametrization of positive semidefinite matrices with zeros.*

We study a class of parametrizations of convex cones of positive semidefinite matrices with prescribed zeros. Each such cone corresponds to a graph whose non-edges determine the prescribed zeros. Each parametrization in the class is a polynomial map associated with a simplicial complex comprising cliques of the graph. The images of the maps are convex cones, and the maps can only be surjective onto the cone of zero-constrained positive semidefinite matrices when the associated graph is chordal. Our main result gives a semi-algebraic description of the image of the parametrizations for chordless cycles. The work is motivated by the fact that the considered maps correspond to Gaussian statistical models with hidden variables. (Received September 21, 2009)