1086-05-2628 **Dominique Guillot**, **Alfred O Hero**, **Brett Naul** and **Bala Rajaratnam***
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Regularization of positive definite matrices: connections between algebra, graph theory and statistics.

Positive definite (p.d.) matrices arise naturally in many areas within mathematics and also feature extensively in scientific applications. In modern high-dimensional applications, a common approach to finding sparse positive definite matrices is to threshold their small off-diagonal elements. This thresholding, sometimes referred to as hard-thresholding, sets small elements to zero. Thresholding has the attractive property that the resulting matrices are sparse, and are thus easier to interpret and work with. In many applications, it is often required, and thus implicitly assumed, that thresholded matrices retain positive definiteness. We will formally investigate the algebraic properties of positive definite matrices which are thresholded. Some interesting and unexpected results will be presented. If time permits, probabilistic properties of thresholded positive definite matrices and connections to optimization will also be discussed. (Received September 25, 2012)