Singular Value Decomposition (SVD)

The singular value decomposition or SVD of the matrix M can be used to gain some additional insight into the approximate inverse (or generalized inverse) X, and also the resolution matrices.
The singular value decomposition of M is

$$M = U\Sigma V^T,$$

where U is the $m \times m$ matrix of eigenvectors of MM^T, V is the $n \times n$ matrix of eigenvectors of M^TM, and Σ is the $m \times n$ diagonal matrix of singular values σ_i, which are the square roots of the eigenvalues of either M^TM or MM^T.