

# An inertia theorem for the indefinite Stein equation and applications

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This talk has two interconnected objectives. The first is to derive an inertia result for Stein equations with an indefinite right hand side. The main tool here is an extension result for isometries in indefinite inner product spaces. The second objective is to identify the inertia of an invertible hermitian block Toeplitz matrix  $T_n = (t_{i-j})_{i,j=0}^n$  in terms of certain associated orthogonal matrix polynomials in the case when the  $(0,0)$ -block entry of the inverse of  $T_n$  is indefinite. The main tools here are the new inertia theorem for Stein equations, and some earlier results of I. Gohberg and L. Lerer on matrix orthogonal polynomials.

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