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**Richard Kollar\*** (kollar@umich.edu), Department of Mathematics, University of Michigan, East Hall 1859, 530 Church St, Ann Arbor, MI 48109. *Krein Signature for Non-selfadjoint Spectral Problems.*

Various problems in stability of nonlinear waves share the same underlying structure. They can be posed as eigenvalue problems in a indefinite metric space. Similar problems also play an important role in inverse scattering of integrable systems. Contrary to self-adjoint problems where all the eigenvalues and eigenfunctions are real, non-self-adjoint problems bring a plethora of difficulties which can be overcome by finding the proper indefinite metric space in which the problem becomes self-adjoint. Unfortunately, to find that metric is sometimes not so straight-forward. We present a perturbative approach which extends the technique known from the study of selfadjoint operators (Krein signature) to non-selfadjoint problems. This is joint work with Peter Miller (University of Michigan). (Received September 20, 2007)