

# What Spectra can Non-Self-Adjoint Sturm-Liouville Operators Have?

R. Hryniv

joint work with S. Albeverio and Ya. Mykytyuk

We address the question, what spectra non-self-adjoint Sturm-Liouville operators on a finite interval can have. Although in the self-adjoint case the question is completely understood, the non-self-adjoint case is more difficult due to possibility of nonsimple and/or nonreal eigenvalues. We solve the inverse spectral problem of reconstructing the complex-valued potential of a Sturm-Liouville operator from two spectra or from a spectrum and the sequence of suitably defined norming constants. We also establish a criterion on solubility of the inverse spectral problem and thus answer the question posed in the title.