

Sharp norm bounds on variation of spectral subspaces under J -self-adjoint perturbations

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joint work with S. Albeverio and A.A. Shkalikov

We establish a number of bounds on variation of spectral subspaces of a self-adjoint operator under off-diagonal J -self-adjoint perturbations. In particular, we obtain an a priori sharp norm estimate on variation of the spectral subspace associated with a part of the spectrum whose convex hull does not intersect the remainder of the spectrum. This bound may be viewed as an analog of the celebrated Davis-Kahan $\tan 2\Theta$ theorem for J -self-adjoint perturbations. We also obtain sharp norm estimates on solutions to the associated Riccati equations. Some of our results are formulated in terms of the Krein space theory.