
YURI LATUSHKIN, University of Missouri

The Maslov index and the spectrum of differential operators

We will review some recent results on connections between the Maslov and the Morse indices for differential operators. The Morse index is a spectral quantity defined as the number of negative eigenvalues counting multiplicities while the Maslov index is a geometric characteristic defined as the signed number of intersections of a path in the space of Lagrangian planes with the train of a given plane. The problem of relating these two quantities is rooted in Sturm's Theory and has a long history going back to the classical work by Arnold, Bott and Smale, and has attracted recent attention of several groups of mathematicians.

We will briefly mention how the relation between the two indices helps to prove the fact that a pulse in a gradient system of reaction diffusion equations is unstable. We will also discuss a fairly general theorem relating the indices for a broad class of multidimensional elliptic selfadjoint operators. Connections of the Maslov index and Hadamard-type formulas for the derivative of eigenvalues will be also discussed.

This talk is based on a joint work with M. Beck, G. Cox, C. Jones, P. Howard, R. Marangell, K. McQuighan, A. Sukhtayev, and S. Sukhtaiev.