

Center of Applied Mathematics & Sciences

Department of Mathematics at UWG

Talk: Computing Eigenvalues of Singular Operators by the Poincare Determinant

Speaker: Dr. Amin Boumenir,

Time: Wednesday, 30th September at 5:00pm

Place: Room 302

Abstract: We are concerned with the computation of eigenvalues of singular non-self-adjoint Sturm-Liouville problems by the method of determinants. The representation of a differential operator by an infinite matrix allows the use of Lidskii's theorem to define its determinant. Then the finite section helps compute the eigenvalues in a simple way while the approximation properties of determinants of trace class compact operators yield an estimate of the truncation error. This direct method borrows stable methods from numerical linear algebra to compute a large number of eigenvalues with high precision, without computing their eigenfunctions as in the classical shooting method. Numerical examples with non-differentiable and complex valued potentials are treated at the end.