



EIGENVALUE ENCLOSURES AND ENCLOSURES FOR NON-SELF-ADJOINT PROBLEMS IN HYDRODYNAMICS

M LANGER

Department of Mathematics
University of Strathclyde
26 Richmond Street
Glasgow G1 1XH
Scotland, UK

In this talk an algorithm is presented which is based on interval arithmetic and yields provably correct enclosures for eigenvalues of non-self-adjoint boundary value problems. Combined with analytical information about the localisation of the spectrum, this algorithm can also be used to prove that certain areas of the complex plane remain free of eigenvalues. The algorithm is applied to boundary value problems on bounded and unbounded intervals, in particular, the Orr–Sommerfeld equation, other problems from hydrodynamics and resonances of Schrödinger operators.

This is joint work with B. M. Brown, M. Marletta, C. Tretter and M. Wagenhofer.