
A FREQUENCY DEPENDENT COMPLEX SCALING FOR HELMHOLTZ
RESONANCE PROBLEMS

Lothar Nannen (TU Wien)
Markus Wess* (TU Wien, Austria)

Using complex scaling (often referred to as perfectly matched layer method) is a popular approach to apply finite element methods to scattering or resonance problems in open systems. In order to optimize the complex scaling for scattering problems it is common to use damping parameters scaled by the given frequency. When considering resonance problems the use of constant damping parameters leads to linear eigenvalue problems. In contrast we study the effects of frequency dependent damping parameters resulting in non-linear eigenvalue problems. In particular we focus on the behavior of the essential spectrum and the spurious eigenvalues generated by discretization.