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Transparent boundary conditions for wave propagation in fractal networks

In this work, we are interested in the propagation of waves in an infinite trees with fractal endings. A possible application is the propagation of acoustic waves in the lung. As far as the numerical resolution is concerned, a crucial issue is the truncation of the effective computations to a finite tree. This is where transparent boundary conditions are needed.

In this talk, I will explained how one construct such boundary conditions for fractal endings as a convolution operator in time whose symbol is characterized as the solution of a particular characteristic equation. This relies on a deep understanding of the mathematical structure of the model.

Finally, we shall present two methods for discretizing such boundary conditions. One consists in the rational approximation of the exact symbol, the second one consists in constructing a transparent boundary condition for a semi-discrete (in time) version of the wave equation (the so-called convolution quadrature method).

This is a joint work with M. Kachanovska and A. Semin.

Fecha	Jueves, 25 de enero de 2018
Lugar	Aula Magna - Facultad de Matemáticas
Hora	10:00
Idioma	Inglés