

Modelling Seismic Wave Propagation Using Time-Dependent Cauchy-Navier Splines

PAULA KAMMANN¹ <pkammann@mathematik.uni-kl.de>

The elastic behaviour of the earth is usually described by the Cauchy-Navier equation. A system of fundamental solutions for the Fourier transformed Cauchy-Navier equation are the Hansen vectors which are known from seismology. We apply an inverse Fourier transform to obtain an orthonormal function system depending on time and space. By means of this system we construct a reproducing kernel Sobolev space and time-dependent Cauchy-Navier splines. These splines can be used for modelling the propagation of a seismic wave from discrete measurements. First, we test this method on a synthetic wave function. Afterwards, we apply it to realistic earthquake data.

¹TU Kaiserslautern, Fachbereich Mathematik, AG Geomathematik