



## **Monitoring weak changes in complex media with coda waves: laboratory experiments**

**E. Larose** (1), J. Derosny (2), L. Margerin (3), M. Campillo (1), P. Gouedard (1), D. Anache (4), C. Hadziioannou (1) and B. Van Tiggelen (4).

(1) LGIT, Un. J. Fourier & CNRS, BP53, 38041 GRENOBLE Cedex 9, FRANCE; (2) LOA, Un Paris 7 & ESPCI, 10 rue Vauquelin, 75231 PARIS Cedex 05 FRANCE; (3) CEREGE, Europôle Méditerranéen de l'Arbois, BP 80, 13545 AIX EN PROVENCE cedex 04 FRANCE (4) LPMMC, CNRS, Maison des Magistères, 25 avenue des Martyrs BP166 38042 Grenoble Cedex FRANCE

Coda waves are visible in the long tails of seismograms, and result from the scattering of elastic waves in the heterogeneous earth. Because waves arriving late in the coda traveled longer in the medium than direct ones, they are more sensitive to a weak perturbation than direct waves. In principle, this feature gives the opportunity to monitor very weak perturbations that could not be observed with direct waves. Nevertheless, in practical applications like the seismic doublets, changes in the coda are also affected by variations of the source (mechanism and/or position). At the laboratory scale, it is possible to control perfectly the source, the receiver and the medium of propagation. In our experiments, the source and receiver are kept fixed over the entire experiment, while a small change in the medium occurs. This experimental setup allows us to isolate the role the medium variations, and to test the feasibility of monitoring procedures at the scale of the crust [E. Larose et al, Phys. Rev. E 73 (2006)].