Project title: Surface wave removal from seismic reflection data using seismic interferometry

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Project summary: While there are seismic techniques which make use of surface seismic waves in imaging the subsurface, there are also those where these types of waves are considered coherent noise. Important examples where the surface waves may significantly degrade the obtained images include different types of reflection seismic surveys (shallow surveys for engineering, environmental and groundwater investigations, and deep surveys for imaging hydrocarbon reservoirs). In a strongly heterogeneous medium, the conventional methods for attenuating these surface waves (such as f-k "velocity" filtering) often do not give satisfactory results. This project will investigate the best practices for the surface wave removal by using the advances in seismic interferometry. Specifically, the seismic signals from different receiver gathers will be cross-correlated in order to generate the surface wavefield between the receivers in question (generating virtual source-receiver pairs). After the surface-wave gathers are produced for the whole survey, they will be adaptively subtracted from the recorded raw data. The best practices for the isolation and adaptive subtraction of surface waves, as well as the general feasibility of the proposed method, will be investigated. This GSI-sponsored short project will employ a research assistant for 6-7 months: the successful candidate should have good programming skills (python and/or Matlab) and basic understanding of the seismic reflection processing.

Required qualifications: BSc/MSc/PhD in physics/geophysics/Earth sciences. Competent use of Python and/or Matlab required (desirably Seismic Unix), as well as basic understanding of the seismic reflection processing
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Start date: Between now and January/February 2018.

Project duration: 6 or 8 months, depending on the candidate skills and qualifications

Salary: A gross salary of €16,965 (including the pension and social contributions) will be distributed over 6 or 8 months (net pay of approx. €1700 - €2200 per month, depending on the skills and project duration)

Note: the project extension is not possible

Application: Please e-mail ivan.lokmer@ucd.ie for the formal application and more information.