

Proposed Studentship



Fault Slip modes on subduction plate boundaries: the role of inherited structures

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Project Description:

Over the last decade, the discovery of slow slip events and non-volcanic tremor at subduction margins around the globe has filled the gap between the fast seismic slip mode and the slow plate motion. This discovery led to an explosion of new theories about fault rheology and slip behaviour along subduction megathrusts, but key observations on the associated structures in the field are still lacking.

Subduction thrust systems are conveyor belts that transport surface sediments and rocks through an ever-increasing pressure-temperature-strain regime. These are unique fault systems because the thrusts exhibit an evolutionary progression from zero displacement in unconsolidated sediments to many km displacement, at depth, along the megathrust. As a general trend, slip is aseismic at shallow depth, while earthquakes and slow slip events and tremors tend to be generated deeper, with the onset of nucleation of microseismicity at around 4 km depth. Slip along the megathrust tends to evolve in a sediment/rock with inherited fabric that was formed by previous slip events and/or during deformation occurring outside of plate boundary fault unit.

The project will aim at studying examples of paleoseismic structures and their relationship to inherited fabric and fluid patterns in carefully selected field areas (Northern Apennines, Corsica, Costa Rica).

Experimental work with high velocity friction experiments will be designed to test the weakening mechanisms of the fault zone material and host rock.

The overall expected objective is to characterize the evolution of slip modes along the subduction plate boundary interface.

Please contact the Postgraduate Programmes Co-ordinator, if you have additional questions about the department or application procedures (email: pgadmin@es.rhul.ac.uk ; fax: 01784-471780; tel: 01784-443581).

An application form can be found here www.rhul.ac.uk/studyhere/postgraduate/applying

Applicants are requested to send an additional copy of their CV directly to the lead supervisor of the project in which they are interested. Please also contact the supervisor if you have any questions about the project itself.