Numerical geomechanics study of the influence of injection scenarios to quantify seismic hazard at Preston New Road

UKUH Integration Event 3

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Small project

Investigators:

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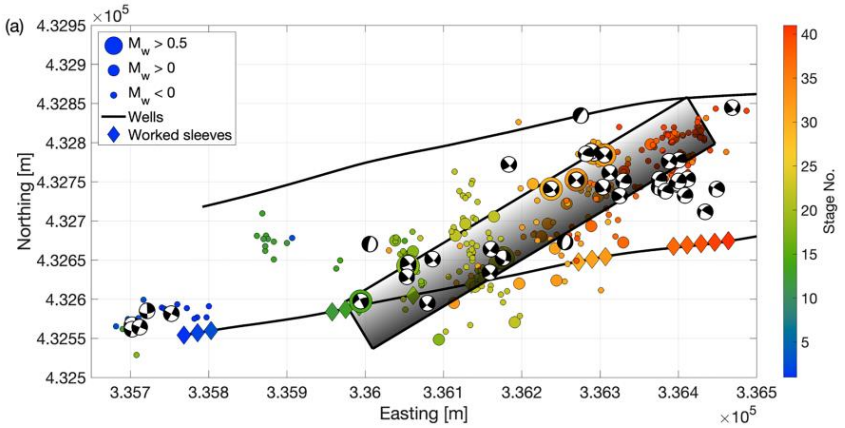
Project background

Seismicity at Preston New Road was a key factor influencing the current mortarium on fracking in the UK

New hydraulic fracture and fault analysis can help quantitatively determine how seismic events are linked to fracking operations



Seismic events and inferred fault structure at Preston New Road. Kettley, Verdon, Werner & Kendall 2020. JGR: Solid Earth

Project objectives

1. Construct a geomechanical fracture and fault model of Preston New Road (PNR) based on microseismic, seismic, and well data, in the Imperial College Geomechanics Toolkit
2. Simulate different injection scenarios and quantify the resulting fracture and fault interaction behaviour, including fault slip and event magnitude
3. Quantify the risk associated with different injection approaches and subsurface properties (fracturing fluid properties, injection rate, injection volume, hydraulic fracture spacing)
4. Produce recommendations for the implementation of hydraulic fracturing to minimise seismic hazard from undiscovered faults