Geophysical Research Abstracts
Vol. 15, EGU2013-10630-2, 2013
EGU General Assembly 2013

Evaluation of a Discrete Fracture Network Model from fractured outcrop analogues

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We describe a procedure which links multiple scale fracture observations to 3-D Discrete Fracture Network (DFN) model simulations. The rationale of the study is to construct realistic DFN models using input data collected at specific scales of analysis; the resultant DFN model is used to predict fracture geometries at intermediate scales, and these predictions are then validated with real data. Fracture networks are characterised from field, terrestrial lidar and satellite image data at a range of scales. Statistical heterogeneity analysis is applied to outcrop- and satellite-scale fracture maps to create input for FracSim3D DFN modelling software. We use terrestrial lidar data to evaluate the constructed DFN models. Several case-studies are considered, involving different lithologies and fracture properties, including length, orientation and intensity.