

Rock Discontinuity Persistence: Current Understanding and New Insights

Abstract: Persistence of geological discontinuities is of great importance for many rock-related applications in earth sciences, both in terms of mechanical and hydraulic properties of individual discontinuities and fractured rock masses. Although important, quantification of persistence remains extremely difficult. In this talk, Dr Shang will first outline the concept of areal persistence and incipency of discontinuities. He will present laboratory and field studies to test the tensile strength of rock discontinuities, showing examples of intact bedded sandstone and incipient discontinuities. He will then describe laboratory and field scale studies to open up incipient joints at two quarries, one at Dryrigg, near Horton-in-Ribblesdale, the other close to Leeds (UK). Both tests identified rock bridge sections of intact rock, with much rougher surface texture compared to the incipient joint section. Finally, he will discuss the implications of this research as a tool to improve our understanding of rock slope stability and fluid flow through rock and hence, nuclear waste containment.

Short bio: Dr Junlong Shang is a Lecturer at the James Watt School of Engineering, University of Glasgow. He holds a PhD in Earth Sciences from the University of Leeds, and was a research fellow at Nanyang Technological University, Singapore. Junlong's research centres on rock mechanics and multiphysics coupling for underground space development and earth resources extraction. In 2020, he was awarded the ISRM Rocha Medal. He serves as a Scientific Editor for Journal of Rock Mechanics and Geotechnical Engineering (Elsevier), and an Editorial Board Member of Rock Mechanics and Rock Engineering (Springer).