



Topography, rock mass strength and pore water pressure

Jia-Jyun Dong and Yi-Ju Su

National Central University, Graduate Institute of Applied Geology, Jhongli, Taiwan (jjdong@geo.ncu.edu.tw)

Relief is a fundamental landscape reflecting the influence of uplift and erosion. Contrary to the traditional concept that the relief is dominated by incision, several researches indicate that the landscape-scale material strength play an important role on the landform process. However, it is difficult to obtain a representative strength parameters based on laboratory rock tests. Slope height and slope angle were frequently used to infer the strength of rock mass. In this research, a series of slope response curves will be proposed to constrain the rock mass strength. Non-linear Hoek-Brown failure criterion will be incorporated into the proposed model where the linear Mohr-Coulomb failure envelop seems oversimplified. Meanwhile, the influence of pore water pressure on the slope stability is considered. Consequently, the strength of rock mass could be inferred from the topography. Cases including stable and failed rock slopes with reported slope height and slope angle are used to validate the proposed model. The result shows that the strength parameter of rock mass could be reasonably inferred from the topography if the pore pressure can be evaluated.