

Numerical simulation of brittle failure of rock using MPS method and DEM

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We develop a novel numerical method for simulating brittle failure of rock in three-dimension. For continuum bodies, we use the MPS method whereas DEM is used to simulate discontinuous bodies. The Weibull distribution in strength distribution is adopted to represent rock like materials. We apply the proposed method to simulate Brazilian test and central straight through crack Brazilian disk test to demonstrate the effectiveness of the proposed method. The numerical results show that the method can simulate the brittle behaviors of rock like materials. The comparison with the laboratory experimental results also indicate that our method can provide appropriate results.

Keywords: failure, numerical experiment, particle method