Contribution ID: **247** Type: **Poster**

Experimental Study on seepage characteristics of sandstone affected by fracture surface roughness and fracture width

Thursday, 17 May 2018 12:45 (15 minutes)

In order to quantitatively describe the influence of the surface roughness of sandstone fracture on its seepage law, the three - dimensional fractal dimension D and three - dimensional surface height deviation Sa are used to characterize the surface roughness of sandstone fracture. Through the seepage test of sandstone specimen with different fracture surface roughness and different crack opening width, the influence of crack surface roughness and crack opening width on the seepage characteristics of sandstone is studied. Based on the ideal cubic law, the seepage model of rough fracture is established. The results show that the larger the surface roughness is, the larger the surface height deviation is, and the 3D fractal dimension D approaches 3. For the same rough fracture, the fracture seepage flow rate increase exponentially with the increase of the fracture opening width, and show obvious nonlinear characteristics. With the same fracture opening width, the seepage flow of the sandstone specimen is affected by the surface roughness of the fracture, and the surface roughness of the fracture is negatively correlated with the flow rate of the fracture seepage, The difference of the seepage flow in the low fracture width stage (50 ~175) is not obvious, The difference of the seepage flow in the high fracture width stage (175 ~300) is obvious; With the increase of the width of the fracture, the effect of the fracture surface roughness on the flow rate of the fracture is reduced. Through the dimension analysis method, the cubic law is improved, and the rough fractured flow model with 3D fractal dimension D is established, and there is a good agreement with the seepage law of sandstone fracture, model is more reasonable.

References

Acceptance of Terms and Conditions

Click here to agree

Primary authors: Prof. XIANGFENG, LIU (Liaoning Technical University); Mr YANJIN, REN (China Construction Eighth Engineering Division Rail Transit Construction Co.LTD)

Presenter: Prof. XIANGFENG, LIU (Liaoning Technical University)

Session Classification: Poster 4

Track Classification: MS 1.20: Porous media evolving mechanism, theory and its applications in energy engineering