

Block system construction and visualization for three-dimensional block-group model

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Summary

Abstract: Realistic computer models of fracture-block systems have significant impacts on the performance of Block-group Model of fractured rock mass, especially for hydro-mechanical problems. In this paper, a reasonable and effective algorithm for block system construction and visualization is presented. The methodology is based on CAGD Computer Aided Geometric Design and employs object oriented programming (OOP) technique to organize project data, including input parameters, research objects, graphic information and analytical results.

The use of traditional key-block theory for the analysis of blocky rock mass structures in mining and civil engineering is well established. And such methods have been used to analyze the stability of rock blocks under excavations. These methods have also been limited to the analysis of relatively few discontinuities, usually assumed to be infinitely persistent. An advanced algorithm for block-group model has removed these limitations and allows the development of a modeler capable of dealing with multiple curved, finite persistent discontinuities. The main advantages of this new algorithm is that it is able to represent more realistically the blocky system connectivity and block system formation for stability or hydro-mechanical analysis using block-group method.

Keywords: block system, CAGD, OOP, block identification, visualization, block-group model

