

金刚石钻进比功及风化花岗岩实时分级研究

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摘要 基于钻进过程监测系统在不同花岗岩地基金刚石钻进中监测数据, 对钻进比功及其变化特性进行分析。结果表明, 金刚石钻进比功随岩石风化程度的减弱而增大, 具有明显的分区性。在软的全风化及强风化花岗岩中, 金刚石钻进比功值低于冲击凿碎比功值; 在中等硬度的风化花岗岩中, 金刚石钻进比功值与冲击凿碎比功值接近; 在硬度较大的微风化花岗岩中, 金刚石钻进比功大于冲击凿碎比功。由此可知, 在中等硬度的花岗岩中, 用冲击凿碎比功来估计金刚石钻进比功才是合适的。这与旋转钻进只适于中硬以下岩层的实际相吻合。最后, 提出采用比功变化曲线进行分区, 并结合比功均值指标与上界指标对岩体进行实时分级的方法。

关键词 [岩石力学](#); [金刚石钻进](#); [旋转钻进比功](#); [花岗岩](#); [岩体实时分级](#)

分类号

STUDY ON SPECIFIC ENERGY OF DIAMOND DRILLING AND REAL-TIME CLASSIFICATION OF WEATHERED GRANITE

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Abstract

Based on the acquisition data of drilling process monitoring(DPM) system for diamond drilling in different granite grounds, specific energy of drilling and the corresponding variation characteristics with depth have been analyzed. The results show that the specific energy of diamond drilling(SEDD) increases with the decrease of weathered degree of the rock and is markedly divisional. The value of SEDD is nearly equal to that of specific energy of percussive drilling(SEPD) in moderately weathered granite. However, the value of SEDD is far less than that of SEPD in very strongly weathered granite and greater than that in slightly weathered granite. Obviously, it is reasonable to estimate SEDD by SEPD in none but moderate hard granite, which agrees with the practice of rotary drilling adaptable to the rock formation with moderate hardness or soft rocks. Finally, based on divisional property of specific energy curve with depth, combining the corresponding average value and upper threshold value of SEDD, a real-time classification approach for rock formation has been provided.

Key words [rock mechanics](#); [diamond drilling](#); [specific energy of rotary drilling](#); [granite](#); [real-time classification of rock](#)

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