

Application of Remote Sensing Technique on the Monitoring of Mine Eco-Environment

Authors : Haidong Li, Weishou Shen, Guoping Lv, Tao Wang

Abstract : Aiming to overcome the limitation of the application of traditional remote sensing (RS) technique in the mine eco-environmental monitoring, in this paper, we first classified the eco-environmental damages caused by mining activities and then introduced the principle, classification and characteristics of the Light Detection and Ranging (LiDAR) technique. The potentiality of LiDAR technique in the mine eco-environmental monitoring was analyzed, particularly in extracting vertical structure parameters of vegetation, through comparing the feasibility and applicability of traditional RS method and LiDAR technique in monitoring different types of indicators. The application situation of LiDAR technique in extracting typical mine indicators, such as land destruction in mining areas, damage of ecological integrity and natural soil erosion. The result showed that the LiDAR technique has the ability to monitor most of the mine eco-environmental indicators, and exhibited higher accuracy comparing with traditional RS technique, specifically speaking, the applicability of LiDAR technique on each indicator depends on the accuracy requirement of mine eco-environmental monitoring. In the item of large mine, LiDAR three-dimensional point cloud data not only could be used as the complementary data source of optical RS, Airborne/Satellite LiDAR could also fulfill the demand of extracting vertical structure parameters of vegetation in large areas.

Keywords : LiDAR, mine, ecological damage, monitoring, traditional remote sensing technique

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