岩石力学与工程学报 2006 25 (07): 1309 ISSN: 1000-6915 CN: 42-1397/O3

目次

隧道及地下空间结构变形的数字化近景摄影测量试验研究

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收稿日期 2005-1-31 修回日期 2005-4-5 网络版发布日期 2006-12-15 接受日期

摘要 为解决大型隧道及地下空间结构变形测量中所面临的困难，提出一种基于数字化近景摄影测量技术的非接触测量方法。该方法使用非量测数码相机，不需在现场布设像控点，完全自由设站，可获得大量监测点在同一时刻变形的整体信息。与传统的收敛仪法和全站仪测量方法相比，该方法具有现场作业时间短、观测信息量大、作业安全等优点。现场试验表明，其观测精度已达到较高的水平，是一种很有发展潜力的结构变形监测手段。

关键词 岩土力学 数字化摄影测量 结构变形 隧道

分类号

TESTING STUDY ON DIGITAL CLOSE-RANGE PHOTOGRAMMETRY FOR MEASURING DEFORMATIONS OF TUNNEL AND UNDERGROUND SPACES

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Abstract

A non-contact digital close-range photogrammetric method is presented in order to overcome the difficulties in the deformation measurement of large-scale tunnel and underground structures. This method employs only non-metric digital camera and requires no control points. One can set camera station arbitrarily and the entire three-dimensional displacement of numerous monitoring points can be obtained simultaneously. Compared with those traditional methods to monitor displacement by convergence measurement devices or total station instruments，it has the advantages of saving time，providing large quantity of measurement information and operational safety. A test is conducted in an actual cavern to verify the accuracy of the photogrammetric measurement for assessing the applicability to deformation measurement in tunnels and underground spaces. A comparison of the photogrammetric measurements with the total station instrument results shows that the measurement accuracy for deformation is considerably good；and it is a promising technique for deformation measurement of structures. An outline of the test and reports how the technique is applied to practical underground projects are provided. Some experiences are also summarized.

Key words rock and soil mechanics digital photogrammetry deformation of structure tunnel

DOI:

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