李小凡,MULLERJanPeter,方晨,赵永红. 2011. 基于TerraSAR-X强度图像相关法测量三峡树坪滑坡时空形变. 岩石学报, 27(12): 3843-3850

基于TerraSAR-X强度图像相关法测量三峡树坪滑坡时空形变

作者	单位	E-mail
李小凡	Department of Geophysics, Peking University, Beijing 100871, China	
MULLERJanPeter	Space and Climate Physics/Mullard Space Science Laboratory, University College, London, U.K.	
方晨	Department of Geophysics, Peking University, Beijing 100871, China	
赵永红	Department of Geophysics, Peking University, Beijing 100871, China	zhaoyh@pku.edu.cn

基金项目：本文受国家自然科学基金项目(40821062、40872133)资助.

摘要：

三峡工程蓄水之后,有可能引起两岸滑坡的发生。本文以三峡库区树坪为研究区域,对不同时相的TerraSAR-X的强度图进行相关计算,求解出2009年2月至2009年10月期间发生的滑坡位移场时空演化。结果表明,在滑坡发生的前几个月,累积变形量很小;在滑坡发生的两三个月当中,变形量比较大,平均位移达到51cm;之后的几个月中,变形量又恢复到平静期的数值,与布设在该区的位移伸缩计结果一致。从本文的研究可以看出,该方法不仅能计算出滑坡引起的形变场,而且能探测地面形变的早期信号,可以用它作为三峡库区未来滑坡监测的重要技术手段。

英文摘要：

It is believed that the weight of water is likely to lead to an increasing frequency of landslide. In theory, land slippage prior to landslide should be observable using sub-pixel correlation of SAR amplitude image. The launch of the German TerraSAR-X, with high resolution (1~3m) and better wavelength stability (X-band), offers a unique opportunity to study this region as the dam was completed. This paper focuses on measurement of landslide in Shuping area along the south riverbank of Yangtze River not far away from the dam. TerraSAR-X amplitude images are correlated to calculate the deformation field of the landslide which occurred in 2009 and reveal its evolution over time. The result illustrates that this method can be used to calculate the displacement field of the landslide and detect the slight movement before the severe slippage, offering a potential means to monitoring and forecasting landslide in Three Gorges Area.

关键词：亚像元相关计算 TerraSAR-X SAR强度图 树坪滑坡 三峡

投稿时间： 2011-02-12 最后修改时间： 2011-07-01

HTML 查看全文 查看/发表评论 下载PDF阅读器