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于田地震同震形变场ALOS干涉雷达观测及初步分析

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中文摘要： 2008年3月21日发生在新疆于田的7.3级地震是继2001年11月昆仑山口西8.1级地震后的最大一次7级以上地震.地震是构造活动的集中反映,会伴随着较大的地表形变及断裂的明显活动,能够放大构造正常的活动方式,同震变形场是这种放大作用在地表的直观反映,对于认识发震断裂运动性质,研究邻近构造活动性具有重要意义.青藏高原西北缘自然环境恶劣,常规方法无法对于田地震开展及时有效的同震形变测量,凸显出差分干涉雷达(InSAR)技术的优势.在介绍InSAR观测原理基础上,通过地震前后ALOS干涉雷达观测获取了于田地震的同震变形场,并结合构造背景揭示出:于田*Ms* 7.3级地震的宏观震中位于康西瓦断裂东南端的南北2个分支(大红柳滩断裂和慕士山南麓断裂)和阿尔金断裂西南端帚状的3个分支交汇的三角地带;于田地震引发了阿尔金断裂一近南北向分支断裂的同震地表破裂,破裂长度为25.6 km;发震断层为正断层,倾向西,上盘的最大运动幅度在200 cm以上;于田地震所在的两大断裂交汇处的构造应力场以近南北向挤压为主.

中文关键词： 于田地震 同震形变场 差分干涉雷达(InSAR)技术 阿尔金断裂

ALOS INSAR COSEISMIC DEFORMATION OF YUTIAN EARTHQUAKE AND INITIAL ANALYSIS FOR GEOLOGY

Abstract: A *Ms* 7.3 scale earthquake occurred in Yutian area, Xinjiang Uygur Autonomous Region, China, on March 21, 2008 is the biggest earthquake after the *Ms* 8.1 scale earthquake happened in Kunlun Mountain, November, 2001. Earthquake is concentrated reflection of tectonic activity, it can be accompanied by a large surface deformation and apparent fracture events, it can zoom the normal activities way of construct. Coseismic deformation is the effect directly reflected in the surface, it is very important for understanding of the nature of earthquake faulting and researching adjacent tectonic activity. In the harsh natural environment of northwestern margin of the Tibetan Plateau, the conventional methods can not carry out timely and effective for the field earthquake coseismic deformation measurement, so the advantages of InSAR technique have be highlighted. This article describes the InSAR observation principle, then gotten Yutian earthquake Co-seismic InSAR deformation field by ALOS PALSAR radar data, and presents geological results: Yutian *Ms* 7.3 earthquake macroscopic epicenter is located in the two north-south branches of Kangxiwar Fault southeast(Large Tamarisk Fault and Mousse Hill Fault) and the three branches of the triangle intersection which in Altyn Tagh Fault southwest; Yutian earthquake triggered a coseismic surface rupture which in Altyn Tagh Fault NS-trending branch, and the length of the rupture is 25.6 km; It is speculation that Yutian fault focal mechanism solutions is the normal fault under the deformed image of the interference radar, faults incline to west, the maximum range of motion on the plate over 200 cm; The tectonic stress around the two big faults intersection where Yutian earthquake occurred is mainly press in north and south direction.

keywords: Yutian earthquake coseismic deformation InSAR Altyn Tagh Fault

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