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利用InSAR资料反演2008年西藏改则M_W6.4和M_W5.9地震的断层参数

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Source parameters of the 2008 Gêrzê M_W6.4 and M_W5.9 earthquakes from InSAR measurements

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摘要 2008年1月9日在我国西藏改则发生了一次M_W6.4地震，随后有40次3.5级以上余震发生，其中最大的一次为1月16日的M_W5.9余震.本文处理了ENVISAT ASAR两轨（升轨和降轨）同震资料，精确确定了同震地表位移的空间分布；随后利用弹性半空间的位错模拟确定了上述事件的断层面参数；最后，基于非均匀滑动模型反演确定了两次地震断面上的滑动分布.结果表明，M_W6.4主震断层为走向218°、倾角52°的西倾断层，最大滑动量约1.9 m，出现在地表以下约7.6 km处；而M_W5.9余震发生在主震断层西3.2 km的地方，发震断层为走向200°、倾角59°的西倾断层，最大滑动量约1.0 m，出现在地表以下约3.9 km处.

关键词 改则地震，断层参数，InSAR

Abstract: On 9 January 2008, an M_W6.4 earthquake struck Gêrzê, Tibet of China, followed by 40 aftershocks with magnitudes equal to or greater than 3.5, including the biggest one with M_W5.9 on 16 January 2008. Two tracks (1 ascending and 1 descending) of ENVISAT ASAR data were processed to precisely determine the locations and amplitudes of coseismic surface displacements firstly. Then the coseismic displacements were inverted to build uniform dislocation models and further distributed-slip models in an elastic half-space. The inverted results suggest that the M_W6.4 main shock is associated with a west-dipping fault plane with a strike of 218° and a dip of 52°, while the M_W5.9 aftershock is related with a west-dipping fault plane, 3.2 km west to the main fault, with a strike of 200° and a dip of 59°; and the peak slip of 1.9 m is located at a depth of 7.6 km in the main fault, whilst the maximum slip of 1.0 m is observed at a depth of 3.9 km in the aftershock fault plane.

Keywords Gêrzê earthquakes, Fault parameters, InSAR

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