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昆仑山强震前的震颤波并非源自慢地震

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The tremor wave before the Kunlun strong earthquake is not slow earthquake event

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摘要

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摘要

2001年11月14日的昆仑山 M_s 8.1级地震前几天,中国地震台网多个台站都观测到了持续数天的低频震颤波信号,由于这些震颤波发生在强震前,所以备受关注.多年来研究人员对该震颤波的产生原因进行过多方探讨,但没有定论.该震颤波信号是否源自强震区的慢地震?是否是地震前兆?或为其它因素?为了回答这些问题,我们从多方面分析和研究了昆仑山强震前中国大陆宽频地震仪所观测的震颤波信号的特征、持续时间、震颤波强度变化与大规模大气运动的关系、信号强度随观测空间的衰减变化特征.结果表明:中国大陆宽频地震仪在昆仑山强震前观测到的震颤波由两个信号组成,其中11月10日开始出现,主要频率范围0.15~0.22 Hz (周期约4~7 s)、持续时间在10~13日的震颤波,主要由同时间段内发生在西太平洋的强台风玲玲(Ling Ling)引发;而11月11日开始出现,主要频率范围0.1~0.13 Hz (周期7~10 s)、持续时间在11~12日的震颤波,不是来自昆仑山强震区的慢地震,而是由来自欧洲北部及欧亚大陆的强温带气旋引发.

关键词 地震观测, 连续震颤波, 昆仑山强震, 温带气旋

Abstract:

A few days before the western Kunlun mountain pass earthquake of M_s 8.1 on November 14, 2001, a number of Chinese seismic stations observed low-frequency anomalous tremor wave signals which lasted several days. Because these tremor waves have been observed before the earthquake, so they got full attention. For many years, many researchers discussed the cause of the tremor waves, but the question is still not settled yet. Is the tremor wave from a slow earthquake event in the Kunlun mountain pass earthquake region? Is it the earthquake precursor or due to other factors? To answer these questions, we make use of the continuous data recorded by broadband seismometers in 10 stations in China seismic network before the Kunlun mountain pass earthquake, to analyze and research the tremor wave signal in characteristics, the duration, the tremor wave magnitude changes and large-scale atmospheric motion, the relationship between the signal amplitude with observation of the space change characteristics attenuation in this article. The results show that the tremor wave signal before the Kunlun mountain pass earthquake in November of 2001 consists of two components. One began to appear on November 10, lasted from November 10-13, with the main frequency of 0.15~0.22 Hz (period of 4~7 s), and was caused by the western Pacific typhoon Ling Ling. The other one began to appear November 11, lasted from November 11-12, with main frequency of 0.1~0.13 Hz (period of 7~10 s), was neither a slow earthquake event from the Kunlun mountain pass earthquake area, but caused by strong extratropical cyclone movement in Eurasia.

Keywords [Seismological observation](#), [Continuous tremor wave](#), [Kunlun mountain pass strong earthquake](#), [Extratropical cyclone](#)

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