

地球动力学★地震学★地磁学

1973~1976年四川松潘强震序列的应力触发过程

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摘要 本文计算和研究了1973~1976年四川松潘4次强震组成的序列引起的库仑应力变化图像, 分析了由该序列各次事件引起的近场应力变化及其与后续强震发生以及余震分布的关系, 同时分析了该序列引起的远场应力变化与随后25年区域中-强地震活动的关系. 结果显示: 1973年8月11日松潘黄龙6.5级地震导致虎牙断裂带中段上库仑应力的显著增加并触发了1976年8月16日的7.2级地震; 此后, 又沿断层向南相继触发了1976年8月22日的6.7级地震和8月23日的7.2级地震. 该序列的绝大多数余震主要发生在主震发震断层的近场库仑应力增加区. 另外, 在该强震序列发生后的25年中、在距该序列发震断层中部约200 km范围内, 6次5.0~6.6级地震均发生在由该序列引起的远场、微量的库仑应力变化增加区中.

关键词 [松潘强震序列](#) [静态应力触发](#) [库仑应力变化](#) [近场](#) [远场](#)

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Stress triggering process of the 1973 to 1976 Songpan, Sichuan, sequence of strong earthquakes

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Abstract In this paper, the patterns of Coulomb stress change induced by a sequence of 4 strong earthquakes occurred in Songpan County, Sichuan province in 1973 and 1976 are calculated and studied. We analyze the near-field stress changes induced by each event in the sequence and their relationship to the occurrence of the succeeding events and to the aftershock distribution. Moreover, we evaluate the far-field effect of stress change that was also induced by this sequence on the regional seismicity of moderate-strong earthquakes occurred in the following 25 years. Our results suggest, firstly, that the M_S 6.5 Huanglong, Songpan earthquake of Aug. 11, 1973 raised Coulomb stress on the mid-segment of the Huya fault and then triggered the M_S 7.2 event of Aug. 16, 1976, and further successively triggered the M_S 6.7 event of Aug. 22, 1976 and the M_S 7.2 event of Aug. 23, 1976 southward along the fault. Secondly, we find that most aftershocks of the sequence occurred in areas where Coulomb stress has been increased along the near-field zones of the seismogenic fault-segments of the mainshocks. Thirdly, in the 25 years following the sequence and within an about 200 km radius area centered at the mid-segment of the seismogenic Huya fault of the sequence, 6 events with magnitudes 5.0 to 6.6 all occurred in those far-field zones with very small amount of increase in Coulomb stress induced by the sequence.

Key words [Songpan sequence of strong earthquakes](#); [Static stress triggering](#); [Coulomb stress change](#); [Near-field](#); [Far-field](#)

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