

<<2008汶川8.0级大地震>>

图书基本信息

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前言

The magnitude Ms 8.0 (Mw 7.9) Wenchuan earthquake occurred on 12 May 2008 in the LongmenShan region of China—the topographical boundary between the Tibetan Plateau and the SichuanBasin——resulting in extensive damage throughout central and western China. To understand theseismic faulting mechanism and surface deformation features associated with the Wenchuanearthquake, including rupture length, geometric characteristics, and slip distribution of co-seismicsurface rupture, our survey group traveled to the epicentral area 2 days after the earthquake andundertook 10 days of fieldwork, during which time we collected fundamental data related torupture structures and the spatial distribution of offset along faults. Based on the results of thispreliminary fieldwork, we carried out additional detailed fieldwork along the co-seismic surfacerupture over the following year. This photographic atlas shows the main deformation characteristics of co-seismic surfacerupture and the nature of the earthquake disaster and subsequent relief operations, based onphotographs taken during our field investigations. This atlas is intended not only for geologists,seismologists, and engineers as a means of furthering their understanding of the seismicmechanisms and surface rupture deformation characteristics of large intracontinental earthquakes,but also for advanced undergraduates and graduate students as a textbook. We are grateful to the many organizations and individuals who helped to make this bookpossible. Thanks are also due to Professor Dong Jia and Dr. Xiaojun Wu of the NanjingUniversity for their assistance in the field.

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内容概要

The Great Wenchuan Earthquake of 2008S: A Photographic Atlas of Surface Rupture and Related Disaster focuses on the main deformation characteristics of co-seismic surface rupture, including rupture length and slip distribution of co-seismic surface rupture caused by the Wenchuan Earthquake and its associated relief operation. The magnitude M_s 8.0 (M_w 7-9) Wenchuan Earthquake occurred on 12 May 2008 in the Longmen Shan region of China, the topographical boundary between the Tibetan Plateau and the Sichuan Basin, resulting in extensive damage throughout central and western China. This atlas contains distinct photographs obtained during the field investigation carried out immediately 2 days after the quake. The atlas is designed for geologists, seismologists and architecture engineers engaged in seismic mechanisms and surface rupture deformation characteristics of large intracontinental earthquakes.

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作者简介

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章节摘录

插图：3.1 Distribution of co-seismic surface rupture. Field investigations reveal that the Ms 8.0 Wenchuan earthquake of 12 May 2008 produced a 285-km-long surface rupture zone along the Longmen Shan Thrust Belt, eastern margin of the Tibetan Plateau, mainly along the pre-existing Yingxiu-Beichuan, Guanxian-Anxian, and Qingchuan faults, which are three of the main active faults within the thrust belt. These faults define a left-stepping en echelon pattern with 10 km clearance. Co-seismic surface ruptures concentrated within a zone of < 50 m in width (generally < 20 m), largely following the strike of pre-existing fault traces within the thrust belt. Based on the geometry and distribution of deformation structures, the Wenchuan rupture zone can be divided into the northern, central, and southern segments. The northern segment, restricted to the fault trace of the Qingchuan Fault, extends for 50 km, terminating at the town of Shazhou in the northeast, near the border between the Sichuan and Gansu provinces. The central segment, 105 km in length, occurs along the northeastern segment of the Yingxiu-Beichuan Fault. The southern segment, 130 km in length, branches into two parallel sub-rupture zones: one along the southwestern segment of the Yingxiu-Beichuan Fault between the towns of Beichuan and Yingxiu, terminating to the south of Yingxiu town, and another along the Guanxian-Anxian Fault (which forms the topographic boundary between the Longmen Shan Range and the Sichuan Basin), terminating to the south of Dujiangyan City near the epicentral area of the Wenchuan earthquake. Field investigations demonstrate that (i) the Wenchuan earthquake occurred upon pre-existing active faults of the Longmen Shan Thrust Belt; (ii) the long rupture length and large thrusting slip resulted from compressive stress associated with eastward extrusion of the Tibet Plateau as it accommodates the ongoing penetration of the Indian Plate into the Eurasian Plate; and (iii) present-day shortening strain upon the eastern margin of the Tibetan Plateau is mostly released by seismic slip along thrust faults within the Longmen Shan Thrust Belt.

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