Book Review

Fault-Zone Properties and Earthquake Rupture Dynamics, ed. Eiichi Fukuyama,
International Geophysics Series, vol. 94, Elsevier/Academic Press, 2009;
ISBN-13: 978-0-12-374452-4

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According to the editor, Dr. Eiichi Fukuyama, this Volume 94 in the International Geophysics Series covers the “marginal research subjects between structural geology and seismology for the understanding of the dynamics of earthquake faulting.” Compared with the “mainstream” contents of the last volume that treated earthquakes in this series, *International Handbook of Earthquake and Engineering Seismology* (Volume 81A-B, 2002-2003), it indeed handles “the marginal subjects related to earthquake rupture dynamics” as he repeatedly emphasized in the preface.

The book is a collection of ten papers on several different aspects of earthquake dynamics, ranging from laboratory-scale measurements to geological and seismological observations in the field or in numerical models. The contributions, mainly review in type, are written by Dr. Fukuyama and his colleagues, and the specific topics in the more observational first part include the geometry and slip distribution of coseismic surface ruptures produced by the intracontinental 2001 Kunlun earthquake in northern Tibet, aseismic-seismic transition along subduction plate boundaries of fossil erosive and accretionary margins, the structure and deformation along the exhumed Zuccale low-angle normal fault in central Italy, and tectonic pseudotachylytes, or solidified friction-induced melts, possibly produced by high speed fault slippage.

The more theoretical second part deals with the effective critical slip distance for seismic and aseismic

fault zones of finite width, scaling of characteristic slip-weakening distance with total slip during dynamic earthquake rupture, the mechanics of fracture on bimaterial faults and generation of nonlinear off-fault damage, and the boundary integral equation method often used in numerically modeling rupture propagation along earthquake faults. Finally, the collection concludes with the paper on the dynamic simulations of the 1995 Kobe, Japan, earthquake.

This volume does not belong to the sort of publications that give the readers a systematic or thorough understanding of something already established. In the introductory paper by the editor, the overview of the historical and recent development in the study of earthquakes is given and a number of related research papers are cited. However, unfortunately, the modest manner of description concludes with a simple enumeration of names and it is difficult for general readers to comprehend from this introduction the connection between the topics discussed in the book. Therefore, although it has an attractive title and unique as well as excellent contents in part, the readers may feel that there is still a gap between “Fault-Zone Properties” and “Earthquake Rupture Dynamics” to be bridged, and some might find the collection too diverse and miscellaneous. But nonetheless, this Volume 94 is interesting to look through and it may provide a more profound insight for those involved in earthquake dynamics. To be sure, it will be a good supplementary material for researchers and graduate students who are interested in earthquake source physics and would like to study the “marginal” subject of earthquake faulting.

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