

Accepted Manuscript

Effects of fault heterogeneity on seismic energy and spectrum

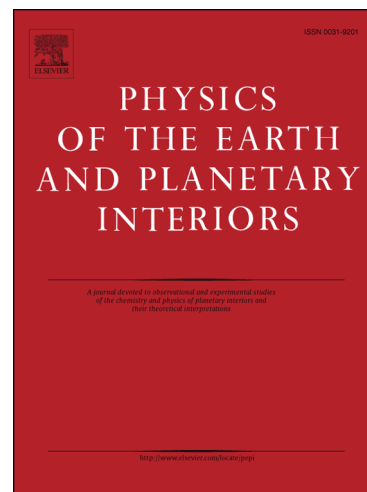
Michele Dragoni, Stefano Santini

PII: S0031-9201(17)30121-8

DOI: <https://doi.org/10.1016/j.pepi.2017.09.010>

Reference: PEPI 6089

To appear in: *Physics of the Earth and Planetary Interiors*



Please cite this article as: Dragoni, M., Santini, S., Effects of fault heterogeneity on seismic energy and spectrum, *Physics of the Earth and Planetary Interiors* (2017), doi: <https://doi.org/10.1016/j.pepi.2017.09.010>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Effects of fault heterogeneity on seismic energy and spectrum

Michele Dragoni^a, Stefano Santini^{b,*}

^a*Dipartimento di Fisica e Astronomia, Alma Mater Studiorum Università di Bologna,
Viale Carlo Berti Pichat 8, 40127 Bologna, Italy*

^b*Dipartimento di Scienze Pure e Applicate, Università di Urbino, Via Santa Chiara 27,
61029 Urbino, Italy*

Abstract

We study the effects of friction heterogeneity on the dynamics of a seismogenic fault. To this aim, we consider a fault model containing two asperities with different static frictions and a rate-dependent dynamic friction. We consider the seismic events produced by the consecutive failure of the two asperities and study their properties as functions of the ratio between static frictions. In particular, we calculate the moment rate, the stress evolution during fault slip, the average stress drop, the partitioning of energy release, the seismic energy, the far-field waveforms and the spectrum of seismic waves. These quantities depend to various extent on the friction distribution on the fault. In particular, the stress distribution on the fault is always strongly heterogeneous at the beginning of the seismic event. Seismic energy and frictional heat decrease with increasing friction heterogeneity, while seismic efficiency is constant. We obtain an equation relating seismic efficiency to the parameters of the friction law, showing that the efficiency is maximum for

*corresponding author

Download English Version:

<https://daneshyari.com/en/article/8915770>

Download Persian Version:

<https://daneshyari.com/article/8915770>

[Daneshyari.com](https://daneshyari.com)