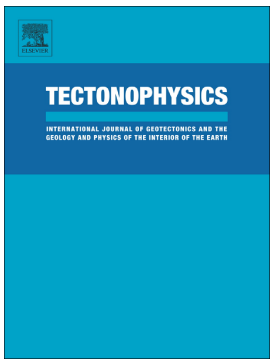
Accepted Manuscript



Hydraulic properties of a low permeable rupture zone on the Yingxiu-Beichuan Fault activated during the Wenchuan earthquake, China: Implications for fluid conduction, fault sealing, and dynamic weakening mechanisms

Qingbao Duan, Xiaosong Yang, Jianye Chen

PII: S0040-1951(17)30402-X
DOI: doi:10.1016/j.tecto.2017.10.002
Reference: TECTO 127640

To appear in: *Tectonophysics*

Received date: 6 March 2017
Revised date: 26 September 2017
Accepted date: 1 October 2017

Please cite this article as: Qingbao Duan, Xiaosong Yang, Jianye Chen , Hydraulic properties of a low permeable rupture zone on the Yingxiu-Beichuan Fault activated during the Wenchuan earthquake, China: Implications for fluid conduction, fault sealing, and dynamic weakening mechanisms. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Tecto(2017), doi:10.1016/j.tecto.2017.10.002

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.

ACCEPTED MANUSCRIPT

Hydraulic properties of a low permeable rupture zone on the Yingxiu-Beichuan fault activated during the Wenchuan earthquake, China: Implications for fluid conduction, fault sealing, and dynamic weakening mechanisms

Qingbao Duan[a,*], Xiaosong Yang[a], Jianye Chen[b]

[a] *State Key Laboratory of Earthquake Dynamics, Institute of Geology, China Earthquake Administration, Beijing, China*

[b] *HPT Laboratory, Department of Earth Sciences, Utrecht University, Utrecht, The Netherlands*

[*] Corresponding author: duan_qingbao@126.com (Qingbao Duan)

Abstract: Fluid transport properties of fault rocks are crucial parameters that affect earthquake nucleation and rupture propagation. In this study, we examined the internal structure, mineral composition and fluid transport properties of fault rocks collected from two shallow boreholes penetrating a granitic rupture zone on the Yingxiu-Beichuan Fault (YBF) that was activated during the 2008 Wenchuan earthquake. Fluid transport properties were measured using water as pore fluid at effective pressures (P_e) ranging from 10 MPa to 165 MPa. Permeabilities of fault rocks exhibit a wide variation from 2.1×10^{-22} m^2 to 4.6×10^{-17} m^2, strongly depending on rock types and overburden pressure. Specifically, at P_e of 165 MPa, the damage zone samples have permeabilities from 5.0×10^{-21} m^2 to 1.2×10^{-17} m^2, and the fault gouges are between 2.1×10^{-22} m^2 and 3.1×10^{-19} m^2. Thus, the YBF consists of a low-permeability fault core acting as fluid barrier, and surrounding high-permeability damage zones acting as fluid conduits. Combining the structural and compositional results and transport data together, we propose that the interplay between cataclasis and fluid-rock interactions controls the hydraulic properties and their response to the

Download English Version:

https://daneshyari.com/en/article/5781442

Download Persian Version:

https://daneshyari.com/article/5781442

Daneshyari.com