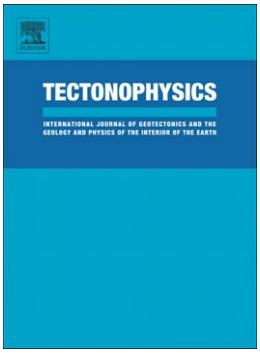

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PII: S0040-1951(16)30601-1
DOI: doi:10.1016/j.tecto.2016.12.006
Reference: TECTO 127348

To appear in: *Tectonophysics*

Received date: 18 March 2016
Revised date: 12 November 2016
Accepted date: 3 December 2016

Please cite this article as: Bac, Bui Hoang, Thanh, Ngo Xuan, Hung, Khuong The, Golonka, Jan, Dung, Nguyen Tien, Song, Yungoo, Itaya, Tetsumaru, Yagi, Koshi, Episodes of brittle deformation within the Dien Bien Phu fault zone, Vietnam: evidence from K-Ar age dating of authigenic illite, *Tectonophysics* (2016), doi:10.1016/j.tecto.2016.12.006

Episodes of brittle deformation within the Dien Bien Phu fault zone, Vietnam: evidence from K-Ar age dating of authigenic illite

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Abstract

Constraining the timing of fault zone origin and movement history is of fundamental geotectonic importance to understand the evolution and processes of the brittle fault structures. The authors present in this paper authigenic illite K–Ar age data from the fault gouge samples, collected from the Dien Bien Phu Fault (DBPF) in the Dien Bien province, Vietnam. as well as in a major strike-slip fault zone in South-East Asia; all of which played important roles in the structural formation and geotectonic development of northwestern Vietnam. The gouge fault samples were separated into four grain-size fractions (<0.1μm, 0.1-0.4 μm, 0.4-1.0μm and 1.0-2.0μm).

The K-Ar ages of the fractions were divided into two age groups, from 26 to 29 Ma and 130 Ma. The timing of the fault movements is defined at 26±0.24 Ma, 29±0.61 Ma, 130.1±1.27 Ma and 130.7±1.29 Ma. This indicates that the Dien Bien Phu fault underwent two movements, first in the Early Cretaceous, with an age of about 130 Ma and second in the Oligocene (Paleogene), with an age of about 26-29 Ma. The ductile deformation of the DBPF terminated during the Early Cretaceous. These studies also indicate slow exhumation of the Dien Bien granitoid complex during the Cretaceous times.