2006 Fall Meeting
Search Results

Cite abstracts as **Author(s) (2006), Title, *Eos Trans. AGU*, *87*(52), Fall Meet. Suppl., Abstract xxxxx-xx**

Your query was:
zeitler

You've chosen **one** document:

HR: 12:05h
AN: **T32B-07**

Vorticity, Erosion, and Crust:Mantle Coupling at Plate Corners in South East Alaska and South East Tibet

AU *** Koons, P O**
EM *peter.koons@maine.edu*
AF *Earth Sciences/Climate Change Institute, Univ. of Maine, Bryand Global Science Center, Orono, Me 04469 United States*
Barker, A
EM *Adam Barker@umit.maine.edu*
AF *Earth Sciences/Climate Change Institute, Univ. of Maine, Bryand Global Science Center, Orono, Me 04469 United States*
Pavlis, T L
EM *tlpavlis@utep.edu*
AF *Geological Sciences,UTEP, 500 West University Avenue, El Paso, Tx 79968 United States*
Liu, Y
EM *cdlyuping@cgs.gov.cn*
AF *Chengdu Inst. Geology and Material Resources, 610082,, Third Avenue South, 5th, Chengdu, 610082 China*
Sol, S
EM *stsd@lehigh.edu*
AF *Earth and Environmental Sciences, Lehigh Univ., 27 Memorial Drive West, Bethlehem, Pa 18015 United States*
Zeitler, P K
EM *Peter.zeitler@lehigh.edu*
AF *Earth and Environmental Sciences, Lehigh Univ., 27 Memorial Drive West, Bethlehem, Pa 18015 United States*
Meltzer, A
EM *ameltzer@lehigh.edu*
AF *Earth and Environmental Sciences, Lehigh Univ., 27 Memorial Drive West, Bethlehem, Pa 18015 United States*

AB South East Alaska and the Eastern Himalayan Syntaxis both form at plate corners defined currently by continental convergence along lateral and normal boundaries. The two plate corners share low and high frequency topographic features characteristic of corner settings and are subject to active surface processes with related extreme topographic relief. Localisation of strain and vertical material flow characteristic of the thermal/rheological perturbation of tectonic aneurysm occur within both plate corners and appear causally associated with the

concentration of erosional power. 3D mechanical modeling confirms the sensitivity of actively deforming zones to advective weakening resulting from erosional concentration. Significant differences between the two plate corners, however, exist in the modern surface kinematics expressed primarily by the curvature, or vorticity, in the horizontal geodetic velocity fields, with the velocity field in south east Alaska curving through <90o while curvature of > 270o has long been recognized around the plate corner of southeastern Tibet. Using knowledge of mantle geometry and kinematics at both plate corners as boundary conditions in fully three-dimensional mechanical models in an investigation of the origin of the surface vorticity field, we demonstrate the sensitivity of the curvature of the surface velocity field to three-dimensional mantle kinematics. Our three-dimensional solution leads to an extension of the concept of crust: mantle coupling beyond that of transmission of simple shear and emphasizes the importance of vertical stretching and shear in vertical planes on the transmission of strain from the mantle to the crust.

DE: 0560 Numerical solutions (4255)
SC: Tectonophysics [T]
MN: 2006 Fall Meeting

New Search