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Journal of Structural Geology

Volume 49, Pages 1-64 (April 2013)

Photograph of the month

Pages 1-2

Shuan-Hong Zhang

Journal of Structural Geology: Student Author of the Year Award for 2012

Page 3

Comparison of methods of algebraic strain estimation from Rf/φ data: A unified theory of 2D strain analysis

Original Research Article

Pages 4-12

Atsushi Yamaji

Highlights

► Theories of strain analysis are formulated consistently in a Minkowski 3-space. ► The strain ellipses determined by algebraic methods are shown to be identical. ► The Shimamoto–Ikeda method, the most popular one, has anisotropic resolution. ► Therefore, the method is inconvenient for error estimation.

Finite strain analysis of the Zhangbaling metamorphic belt, SE China – Crustal thinning in transpression

Original Research Article

Pages 13-22

Qing Zhang, Scott Giorgis, Christian Teyssier

Highlights

► Finite strain analysis, SPO analysis, and forward strain modeling are performed. ► The deformation of the ductile–brittle transition zone is flattening to plane-strain dominated. ► The deformation of the Zhangbaling schist is monoclinic. ► The ductile and ductile–brittle crust experienced 18–36% and 18–30% thinning. ► The minimum thickness of this midcrustal section is of ~7.5 km.

Detachment levels in the Marathon fold and thrust belt, west Texas

Original Research Article

Pages 23-34

James B. Chapman, Reid S. McCarty

Highlights

► We present a model for the structural architecture for the Marathon fold and thrust belt. ► New subsurface data is incorporated with surface exposures. ► A bed-parallel detachment in the lower Tesnus Formation separates structural lithic units. ► A perched décollement in the foreland was later reactivated as a roof thrust to duplex systems. ► The structural model we present may be applicable to much of the Ouachita orogenic system.

Microfabric and anisotropy of elastic waves in sandstone – An observation using high-resolution X-ray microtomography

Original Research Article

Pages 35-49

Wolf-Achim Kahl, Robert Hinkes, Volker Feeser, Astrid Holzheid

Highlights

► Sandstone plugs used in ultrasonic measurements were investigated with X-ray μ -CT. ► The bulk anisotropy of P-wave velocities can be correlated to the sandstone fabric. ► Both tortuous grain skeleton and pore structure govern the elastic wave propagation. ► New perspectives for microfabric analysis by high-resolution μ -CT below 10 μ m-range.

A model of strain localization in porous sandstone as a function of tectonic setting, burial and material properties; new insight from Provence (southern France)

Original Research Article

Pages 50-63

Roger Soliva, Richard A. Schultz, Gregory Ballas, Alfredo Taboada, Christopher Wibberley, Elodie SAILLET, Antonio Benedicto

Highlights

► Three types of deformation bands sets formed under extension and contraction, in two different sands and at shallow depth. ► These bands sets differ in their spatial distribution, their degree of cataclasis and the obliquity of force chains. ► Ratio of shear to compaction for shear-enhanced compaction bands is 1, compactional shear bands is 10, and shear bands is 25. ► Stresses were quantified as a function of Earth pressure coefficient at rest, burial depth and tectonics environment. ► Strain localization in sands reflects burial conditions, tectonic stresses and material properties.