Geophysical Research Abstracts
Vol. 17, EGU2015-7605, 2015
EGU General Assembly 2015

South China Sea: New geodynamic constraints

Jean-Claude Sibuet (1), Yi-Ching Yeh (2), Shu-Kun Hsu (3), Chao-Shing Lee (4), Jing-Yi Lin (5), and Jonny Wu (6)

(1) Ifremer Centre de Brest, BP 70, 29280 Plouzané Cedex, France, (2) Taiwan Ocean Research Institute, 219, Sec. 1 Dongfang Rd., Qieding Dist., Kaohsiung 852, Taiwan , (3) Department of Earth Sciences, National Central University, 300 Jhongda Road, Jhongli City, Taoyuan County 32001, Taiwan , (4) Institute of Applied Geophysics, National Taiwan Ocean University, 2 Pei-Ning Road, Keelung 202, Taiwan , (5) Department of Earth Sciences, National Central University, 300 Jhongda Road, Jhongli City, Taoyuan County 32001, Taiwan , (6) Department of Geosciences, National Taiwan University, P. O. Box 23-13, Taipei, Taiwan

Magnetic modeling shows that the youngest magnetic anomaly in the South China Sea (SCS) is either younger than C5c (15.5 Ma, Briais et al., JGR, 1995) or C6A1 (20.5 Ma, Barckhausen et al., MPG, 2014). Close to the rift axis of the East basin, Ar-Ar age dating of oceanic crustal rocks collected during IODP Leg 349 gives ages of 15 and 15.2 +/- 0.2 Ma (Koppers, Fall AGU meeting, 2014), which seems to favor the 15.5 Ma age given by Briais et al. modeling. However, basaltic samples were recovered in a sill and further below in another sill or inside the true oceanic crust. As post-spreading magmatic activity (∼8-13 Ma) largely masks the spreading fabric, in particular near the previously identified E-W portion of the extinct ridge axis of the East Basin, the location of the central magnetic anomaly and spreading rates are incorrect. The compilation of the extremely dense set of magnetic data and published swath bathymetric data shows that if post-spreading volcanics hide the seafloor spreading magnetic fabric mostly along and near the extinct spreading axis, the whole SCS is characterized by rift directions following three directions: N055°in the youngest portion of the SCS, N065° and N085° in the oldest portions of the SCS. We conclude that the extinct ridge axis is N055° trending instead of E-W. We are also able to propose a preliminary kinematic sketch of the evolution of the SCS in 6 steps, which will be used to carefully establish the SCS magnetic pattern and forward magnetic modeling of the SCS.
From this preliminary kinematic sketch, we have established a new fracture zone pattern, which highlights conjugate segments of SCS continental margins. We have also used the unfolded and restored Manila slab to highlight a roughly N-S dVp discontinuity located inside the slab, suggesting the existence of a roughly N-S limit, which defines a new segment of conjugate margins. In addition, the extinct spreading center, which ends close to the Manila trench, jumps to the north and then continues within the Manila slab following a slow dVp trend, which might correspond to the location of the extinct spreading axis.