Geophysical Research Abstracts,
Vol. 11, EGU2009-1909, 2009
EGU General Assembly 2009

Complex examination of transverse faults of Tropic segment of Mid –Atlantic Ridge: some doubts related to present transform faulting model by D.Wilson

A.V. Kalinina and S.M. Ammosov

Institute of Physics of the Earth RAS, seismology, Moscow, Russian Federation (kalinina_av@mail.ru, +74992556040)

Recent decades of research had brought vast amounts of geological and geophysical data that allowed questioning some tenets of Plate Tectonics. There are several principal facts which are hard to explain in current Plate Tectonics model: 1) thick subcontinental crust was found under oceans especially under Atlantic Ocean where Mid-Atlantic Ridge (MAR) was placed upon the fragments of Precambrian mantle–crust basement (Trukhalev et al., 2004); 2) in the Atlantic Ocean the significant density asymmetry of the upper parts (up to 6-10 km) of crust segments on opposite flanks of the MAR was revealed: Eastern slope –2,7g/cm3, Western slope – 2,3 g/cm3 (Budanov at al.,1980). The research of the majority of transverse Fault Zones (FZ) of Tropic segment (for example, Kane and Vema – Doldrams - Vernadsky) showed clear distinctions in their deep structure and even more difference in the mineral composition, geochemistry and age of dredged samples despite the fact that they have similarity in their bottom relief. To calculate Bouguer gravity anomaly map we used high precision ocean gravity measurements (up to 0,3-0,5 mgals). “Synergetic” examinations of seismology data, structures of the ocean bottom relief and Bouguer gravity anomaly map which reflects relief of the crust bottom allow to give more precise definition to present transform faulting model by D.Wilson. Sub-meridian segments of MAR are practically aseismic in the considered regions. The majority of seismic events occur in faults zones; the focal mechanisms are practically pure strike slip with main axes of tension forces of NE-SW direction and pressure forces of NW-SE direction. These facts confirm geological (meridian spreading from axis of FZ with fresh basalt effusion) and gravimetrical (inversions of density) evidences that above-mentioned FZ, particularly Vernadsky fault, close resemble typical rift zone.