# Density and geodynamic models of the lithosphere of the Philippine Sea plate – the Asian continent, Taiwan area juncture zone.

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The Philippine plate - the Asian continent interaction zone in the Taiwan area is considered. The work uses geophysical data obtained by the Pacific Oceanological Institute, Far Eastern Branch, the Russian Academy of Sciences (POI FEB RAS) in the near Taiwan area of the Philippine, East China and South China Seas, in the course of expeditions on the R/Vs "Academician A. Nesmeyanov" (1989) and "Professor Gagarinsky" (1993-1994), and the results of seismic studies presented in the contribution [1]. Based on the gravitational modeling the structural-density models of the crust and subcrustal lithosphere have been constructed for three profiles crossing the Ryukyu and Luzon island-arc systems. Stress field calculation and evaluation of the density inhomogeneity contribution to the modern geodynamic state of the region have been made on the basis of the gravitational modeling. The main results come to the following points. 1. Structural-density differentiation of the lithosphere is established. 2. Three types of the lithospheric blocks are distinguished according to the average density difference, peculiarities of the lateral distribution of density inhomogeneities in the crust and mantle, and according to the geodynamical parameters: the oceanic, island-arc and continental-margin blocks. 3. Within the area studied the boundary between the island-arc and continental-margin lithospheric blocks is accompanied by the through unconsolidation of the crust and subcrustal lithosphere. Existence of such a zone is associated with the destructive character of the processes, occurring in the back areas of the island arc. 4. Within the West Philippine Basin and Ryukyu-Taiwan sector of the convergent zone two different structural-density and geodynamic sectors exist, the boundary between these passes by $123^0$E longitude, where the Gagya submarine ridge is extended. 5. Numerical values of the stresses generated within the lithosphere due to density differentiation, are sufficient to form the fault or tectonically weakened zones ($10^9 – 10^{10}$ Pa). The conclusion is made on this basis that the crust-mantle density inhomogeneities are considered to be one of the sources of geodynamic stresses, deformations and transfer of masses in the medium studied.
Keywords: Taiwan, gravitational modeling, geodynamic.

## References

[1] Wang K.T., K.McIntosh, Y.Nakamura, C.Liu and H.W.Chen, *Marine Geophysical Researches* 22, pp. **265-287** (2001).