Geophysical Research Abstracts
Vol. 14, EGU2012-6195, 2012
EGU General Assembly 2012

Plutonic ultramafic-mafic complexes of the Vel'may terrane, eastern Chukotka (Russia): first petrological results and preliminary geodynamic interpretations

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The Vel'may terrane (eastern Chukotka) is commonly considered as a continuity of the South Anyui Suture (SAS) zone (western Chukotka) and the Angaucham terrane (Brooks Range, Alaska), which marks the southern boundary of the Arctic Alaska – Chukotka displaced continental microplate (AACM). The correlation of terranes bounding the microplate is based on findings of similar upper Triassic (Norian) faunas (Tynankergav, Bychkov, 1987; Sokolov et al., 2009) and the ubiquitous occurrence of ultramafic-mafic plutonic complexes attributed to be ophiolite fragments. However, plutonic complexes of the Vel'may terrane haven't been petrologically investigated till now. In the study area they spatially associate with upper Jurassic-lower Cretaceous deposits of the Cross Bay zone and upper Triassic sequences of the Kolyuchinskaya Bay zone. In the Cross Bay zone ultramafic and mafic rocks compose small tectonic slices and are represented by non-spreading subduction-related restite spinel harzburgites and shallow-level plagioclase peridotite and gabbro cumulates (crystallization pressure is estimated at 3.5±1 and 1.5±1 kb ((Schmidt, 1992), respectively) closely resembling fragments of an ophiolitic assemblage. In the Kolyuchinskaya Bay zone tectonic slices of ultramafic and mafic rocks are dominated by clinopyroxene-bearing dunites, hornblende wehrlites/olivine clinopyroxenites and hornblende gabbros. This rocks are high-pressure cumulates (crystallization pressure is estimated at 8±1 kb (Schmidt, 1992)) of lower crustal magma-chambers originated in a mature island-arc or an Andean-type active continental margins. Remnants of subduction-related ophiolite and magma-chambers are typical of sutures indicative of an arc-continent collision; and they occur widely in the SAS zone (Lychagin, 1985; Ganelin, Sylantyev, 2008) and the Angayucham terrane (Loney, Himmelberg, 1989). Thus, the Vel'may terrane can be considered as a possible marker of the AACM boundary.

This work was supported by the Russian Foundation for Basic Research (project No 10-05-00529) and Program of the Leading Scientific Schools (grants No 3919.2010.5 and 7091.2010.5).