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Age and paleomagnetism of the Precambrian Listvyanka dyke swarm (South Siberia): implications for Nuna and Rodinia

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Mafic dykes are among the most attractive paleomagnetic targets. They can be precisely dated and typically contain highly stable single-domain magnetite. Several Proterozoic mafic dyke swarms and some associated sills are located along the western shore of Lake Baikal and in the basement inlier of the Archean Tungus superterrane of the Siberian craton, known as the Sharyzhalgai metamorphic massif. Until recently these dykes have not been precisely dated. In 2009 we collected oriented paleomagnetic samples from ten dykes near Listvyanka village on the coast of Lake Baikal north of the Angara riverhead. These dykes vary in geochemistry and probably represent more than one magmatic event. The largest dyke of coarse-grained gabbro-dolerite of sub-alkaline composition has been dated by U-Pb (baddeleyite) method at 1350 $\pm$ 6 Ma. This dyke carries a stable remanence, the calculated VGP is close, but not identical to the VGP from one dyke of the 1384 $\pm$ 2 Ma Chieress dolerite swarm in the eastern Anabar shield of the Siberian craton. The other dykes represented by fine-grained dolerites of tholeiitic composition yield a different paleomagnetic direction with a low inclination. This direction is only slightly different from the remanence direction of the c. 760 Ma Kitoi shallow-dipping mafic sheets in the Sharyzhalgai massif. These results are supportive to the recently published paleogeographic reconstructions of Rodinia and Nuna.