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IDENTIFICATION OF THE NORTH AMERICAN PLATE IN EAST SIBERIA BY MEANS OF GPS

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Since 1995, the Russia/US collaborative Project RUSEG provided GPS observations over the vast landmass of east Asia including the Arctic region. Project participants are: RDAAC/GSRAS (G. Steblov) on the Russian side; Columbia U. (M. Kogan and C. Scholz), MIT (R. King), and U. of California - Berkeley (R. Burgmann) on the US side. The authors of this talk analyzed convergence of Eurasian, North American, and Pacific plates in east Asia using the GPS solution LDO_030112. It is based on observations collected in 1996-2002 at about 50 stations in east Siberia, the Urals, Kamchatka, and Sakhalin, combined with 74 global IGS stations and 6 stations in the Pacific plate. The 3-plate reference frame is defined independently of geologic plate models. Comparison of velocities in east Asia relative to Eurasia and to North America allows us to conclude that east Siberia to the east of the Cherskiy Range belongs to the North American plate. This was hypothesized since the onset of the plate tectonic concept but it was never proved geodetically. The plate geometry in east Asia compatible with GPS velocities is the simplest possible: the interaction of three major plates. The existence of microplates in this region is not evidenced by GPS. A distributed non-platelike deformation is characteristic of China. Plate-related GPS velocities in stable interiors of Eurasian, North American, and Pacific plates are remarkably uniform and small, 0.6-0.7 mm/yr indicating average strain rates on the order of 1e-10.