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Ongoing glacial-isostatic adjustment and present-day motion of tectonic plates

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The effect of glacial-isostatic adjustment (GIA) on the motion of tectonic plates is usually neglected. Employing a recently developed numerical approach, we examine the effect of glacial loading on the motion of the Earth's main tectonic plates where we consider an elastic lithosphere of laterally variable strength and the plates losely connected by low viscous zones. Aim of the paper is to show the physical processes which controls the GIA induced horizontal motion and to assess the impact of plate boundaries. We show that the present-day, very precise GPS observations of surface velocities need to be corrected for GIA-induced horizontal motion, if the motion of the tectonic plates is to be modelled with an accuracy better than 1 mm/yr.