

Energy of Lithosphere Plate Deformation

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The crust surface deformation is assumed to be the result of lithosphere processes, which in their turn are connected with convective motion within asthenosphere. The energy needed for this lithosphere process has to be estimated only by use of the crust surface deformation and common physical properties of the lithosphere material. When the scale of deformation has the order of 100 km and the period of deformation is about million years, the lithosphere can be considered as a layer of very viscous liquid with the friction force from asthenosphere applied

to its lower boundary. This model allows to estimate size and energy of the lithosphere deformation using only horizontal extent of the crust surface deformation. The received estimate connects the energy spectrum with the wave spectrum of the surface deformation of a mountain range or more complicated relief structures. The value of the whole earth lithosphere deformation per year calculated by this way was found to be of the same order that the energy of earthquake related to the same period.