Seasonal changes in gravity and earthquake occurrence in the North-Western High Asian Mountains

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The North-Western Asian High Mountain area is one of the most seismologically active regions in the world. It is mostly covered with snow and glaciers, and earthquakes here are characterized by the dominance of reverse and strike-slip faulting. The GRACE (Gravity Recovery and Climate Experiment) satellite gravity data indicate that April/October are the months when the load is at its maximum/minimum, and they are followed by gradual load decrease/increase. The study of International Seismological Center (ISC) data, having magnitude $\geq$6 and foci $\leq$50 km, indicates a statistically significant seasonal earthquake occurrence. Earthquake frequency increases gradually with the unload phase and maxima is observed in October. It indicates that the seasonal load change is probably greater than the annual tectonic strain build up. Consequently, it discourages the stress release in winters (load time) and earthquakes have higher probably of occurrence in summers (unload time).

Keywords: GRACE data, Seasonal load change, Earthquake occurrence

