

## Enigma of annual crustal deformation: a solution found

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Distinct periodic variations with annual frequencies are often found in the time series of continuous GPS site coordinates in northeastern Japan. They show maximum arc-normal contraction of a few millimeters as well as maximum subsidence of 1-2 centimeters, both in March. In northeastern Japan, it snows heavily on the western flank of the backbone range, attaining the maximum depth of up to a few meters in March. I show that the surface loads caused by the snow are largely responsible for the annual displacement of GPS sites, by comparing the load distribution estimated from the GPS data and the observed snow depths. The load also modulates secular strain build-up in northeastern Japan, but its relevance to the seasonal change of earthquake occurrences remains uncertain.

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