

# **The Use of Atmospheric Reanalyses to Study Earth's Crust Deformations**

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The Earth as a whole responds to external forcing as an elastic body. Variations in the atmospheric pressure cause Earth's deformations that reach several centimeters. Modern space geodesy techniques are capable not only to detect such displacements, but provide a quantitative validations of models at a level of several per cents. The space geodesy community utilizes the service of the atmospheric pressure loading and apply to data analysis the site displacements caused by atmospheric processes on a routine basis. This became possible owing to the unrestricted availability of numerical weather models to the scientific community. Proper modeling atmospheric pressure loading is important for two reasons: 1) including loading into data reduction improves accuracy of operational data products; 2) subtraction of known contributions to the observed field of Earth's crust deformations helps to reveal remaining signal that needs to be explained. The new generation of the atmospheric pressure loading models is discussed. In particular, the justification of requirements of space geodesy community to reanalysis products is emphasized: their homogeneity, i.e. a lack of jumps, reliability of long term trends, better spatial resolution, better temporal resolution, shorter latencies.

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