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Regional 2D model of deformations in Central Europe from GNSS observations: general assumptions of project

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The aim of project, started at the end of 2010, is to examine the possibility of construction of the present-day deformation model for Central Europe (focused on Poland) based on EUREF Permanent Network (EPN) and Polish multifunctional satellite network (ASG-EUPOS) data. It was a common sense that the ASG-EUPOS sites should not be used for geodynamical investigation purposes due to insufficient stabilization and fixing of antennas and not passable observation time span (the system has started in June 2008). In our experiment we are going to examine if using advanced mathematical analyses method we will be able to extract a credible geodynamical information from this set of "incredible" data. In order to build kinematic model of deformations, we are going to choose, from over 150 stations, these ones which best meet the measurement quality criteria, but also taking into account their localization in respect to structure of tectonic background. Robustness of geodetically-defined kinematic model in description of recent geodynamics will be tested by numerical finite element modelling of stress and strain distribution in analyzed region. Simplified mechanical model of the lithosphere will incorporate geological and geophysical data including tectonically defined discontinuities. Results of model predictions will be evaluated by comparison with measured present-day stress and strain. The set of data for geodynamic considerations could be broaden radically, allowing for characterization of strain field discontinuity. This interdisciplinary project is financed by the Polish Ministry of Science and Higher Education.