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GIOVE-A orbit determination and analysis of dynamical properties based on SLR tracking data

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SLR tracking data provided by the International Laser Ranging Service (ILRS) network are used to compute the orbit of the first European Galileo In-Orbit Validation Element (GIOVE-A) satellite, launched in December 2005. The equation of motion is computed through an exhaustive dynamical model and is propagated with the orbit determination software GINS of the French CNES/GRGS (Groupe de Recherche de Géodésie Spatiale) geodetic team.

The set of SLR data is processed and the results of the post-fit residuals analysis are shown. The orbit validation for GIOVE-A is based on overlaps between 2-day, 10-day and 30-day arcs calculated with GINS software. The resulting 3D rms and radial residuals are the primary criteria for the internal accuracy of SLR orbits and may indicate possible dynamical perturbations such as orbit or attitude control maneuvers.