Computation of space objects trajectories by optical measurement in double visibility pick-up range of space surveillance ground stations

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The article covers issues of detecting the space object location in the near-Earth space using the optical ground stations measurements. The work describes the algorithm of searching the object status vector when the object is moving in the double visibility pick-up range of the optoelectronic space surveillance stations within a short time period. We show the technique of defining the velocity vector by coordinate vectors obtained through the triangulation method. The methods of approximation and filtering individual measurements from optical ground stations as well as the method of evaluating the quality of measurement sessions are discussed. We demonstrate the results of navigational data processing with an example of a few geostationary objects and compare the orbital parameters obtained with the standard ones. The conclusions are drawn about the reasonability and conditions of using the method of defining the object trajectory when the object is in the double visibility pick-up range of the ground stations. The article suggests the ways to increase the precision of the solutions obtained.

Keywords: *space object, orbit determination, optical means, approximation, space triangulation method*

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