

18th IAA SYMPOSIUM ON SPACE DEBRIS (A6)
Virtual Presentations - 18th IAA SYMPOSIUM ON SPACE DEBRIS (VP)

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ANALYSIS OF HISTORICAL PHOTOMETRIC DATA OF BEIDOU-G2

Abstract

Based on the photometric observation data of BeiDou-G2 from 2011 to 2019, the rotational speed variation in 8 years is obtained through spectral analysis. The rotational dynamics model is established, in which the gravity gradient torque and the solar pressure radiation torque are considered. Genetic algorithm is used to search the rotational state of the target. The parameters to be estimated include: the orientation of rotation axis in space, the specular and diffuse reflection reflectivities of the solar panel surfaces, the pitch angles of solar panels, and a small modification value of initial rotational speed. Because it was failed to find the rotational state that satisfies all the data, a separate computing strategy is adopted to estimate the rotation variations in different intervals. The fitting residuals are less than 5