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TETHERED SATELLITE-BASED HIGH PRECISION MAGNETIC FIELD MEASUREMENT
TECHNIQUES

Abstract

As the developing of science, geomagnetic survey is applied quite widely, the applying fields contain mostly aeronautics and aerospace, space science survey, weapons and equipment, biology and physic engineering, archaeology, geology survey, earthquake forecast, and so on. It's an exigent need to gain accurate results of geomagnetic survey. Geomagnetic is a vector field, which needs multidimensional observations to reduce the possibilities of the earth physics explanation. This paper design a constellation scheme, which is composed of two tethered formate, one contains two satellites connected with a tether. The first formate runs in a circular orbit of 450 km height and 87inclination, the second formate runs in a circular orbit of 550 km height and 88inclination. Three geomagnetic survey payloads are fixed on the tether between the two satellites in a formate. The result of the simulation shows, the scheme can gain accurate results of geomagnetic survey. The mode of the tethered formate keeps the payloads away from the electromagnetism disturbing of the satellite platform, furthermore, it can achieve graduation information of the geomagnetic. In the geomagnetic survey from space, the use of constellation and tethered formate can greatly improve spatial resolving ability and separate the variation of time and space. Moreover, we can obtain the geomagnetic information all over the world more quickly to separate the geomagnetic field of the interior and exterior source.