

SPACE DEBRIS SYMPOSIUM (A6)  
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RESEARCH ON CHARGING EFFECT OF SMALL & MEDIUM-SIZED SPACE DEBRIS IN  
IONOSPHERE PLASMA ENVIRONMENT

**Abstract**

Aiming at the problem of space debris charging in the space plasma environment, the coupling relationship between the distribution law of small and medium-sized (SMS) space debris in Low Earth Orbit (LEO) and the distribution characteristics of Ionosphere plasma is analyzed. SMS space debris is equivalent to the isolated spherical conductor, and its surface charging model is developed based on the theory of plasma sheath. The comparative analysis of debris charging effect in LEO low latitude and polar orbit is carried out, the results show that the cm level debris in polar orbit charges in the order of  $10e-12C$ , significantly higher than the low latitude debris charging. The research results can provide new ideas for the removal of SMS debris in LEO with electric field force.