

METHODS FOR EFFECTIVE JOINT OBSERVATION OF SPACE DEBRIS USING EISCAT, QIJING AND IRKUTSK RADARS

Valentin Lebedev¹, Zonghua Ding²

*¹Institute of Solar-Terrestrial Physics SB RAS, Irkutsk, Russia,
lebedev@iszf.irk.ru*

²China Research Institute of Radiowave Propagation

We put forth a methodology for efficient joint space debris observations using the EISCAT (Ultra-High Frequency and Extremely Low Frequency: 19°13'28.62'' E, 69°35'10.67'' N, polar region), Irkutsk Incoherent Scatter Radar (103°18' E, 52°52'53''N, mid-latitudes), and Qijing Incoherent Scatter Radar (103°48' E, 25°36' N, subtropics). Each radar is situated in a distinctive geographical and geophysical location. Furthermore, the antenna of each radar has its own unique set of characteristics.

This paper will present a methodology for combining space debris observation statistics, taking into account the geographical location of the three radars, in order to obtain the most efficient and useful data on the orbital parameters of the currently most important class. A joint analysis of such measurements will facilitate the efficient correction and improvement of space debris models. The spacing of the radars in longitude and latitude will enable more precise estimation of the distribution of the orbital plane position and orbital periods.

Comparing the distribution of space object clouds under different geomagnetic conditions will allow evaluation of the geomagnetic and solar activity influence on the dynamics of space object orbits.