

Ionospheric Correction of Space Radar Data

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A b s t r a c t

Radar is a critical tool for maintaining knowledge of the many objects in low Earth orbit and thus for maintaining confidence that societies around the world are secure against a variety of space-based threats. It is therefore important to raise awareness that LEO objects are embedded in the envelope of relatively dense plasma that co-rotates with the Earth (ionosphere–plasmasphere system) and thus accurate tracking must correct for the group delay and refraction caused by that system. This paper seeks to promote that awareness by reviewing those effects and highlighting key issues: the need to customise correction to the altitude of the tracked object and prevailing space weather conditions, that ionospheric correction may be particularly important as an object approaches re-entry. The paper outlines research approaches that should lead to better techniques for ionospheric correction and shows how these might be pursued in the context of the EURIPOS initiative.

Key words: space weather, space surveillance, ionospheric correction, radar, space situational awareness.