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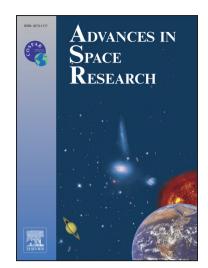
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Ionospheric effects on repeat-pass SAR Interferometry

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Abstract

InSAR measurements can be significantly affected by the atmosphere when the radar

signal propagates through the atmosphere since it varies with space and time. Great

efforts have been made in recent years to better understand the properties of the

tropospheric effects and to develop methods for mitigating these effects. By using the

basic principles of InSAR, the quantitative analysis of ionospheric delay effects on

topography and surface deformation have been introduced for the first time. The

measurement errors can be related to the vertical ionospheric total electron content

(vTEC). By using the ionospheric observations, the effects of temporal ionospheric

variations on InSAR have been analyzed. The results indicate that the ionospheric

variations with time, season, solar cycle and geomagnetic activities can compromise

the effectiveness of InSAR for both the measurement of topography and surface

determination. The repeat-pass SAR interferometry errors induced by ionosphere

should be corrected by actual measurements.

Keywords: InSAR; Ionospheric variations; Total electron content; Topography; Surface

determination

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