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Assessing Ionospheric effects on L-band SAR data: Implications to co-seismic deformation measurements on the Sichuan Eartquake.

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SAR data from the Alos L-band sensor (PALSAR) is an efficient tool for ground surface deformation measurements using both radar interferometry (INSAR) and sub-pixel image correlation.
On the recent Sichuan earthquake, these methods were successfully used by several Research teams in order to estimate the deformation field and to detect the surface rupture.
The main interest of L-band InSAR is due to the fact that results are less affected by temporal decorrelation than C-band InSAR data, especially in highly vegetated areas.
However, the L-band deformation maps are severely hampered by ionospheric contributions to the radar signal. In particular, the azimuth offsets (pixel displacement along the orbit) are affected by “stripes” with amplitudes that could be higher than the deformation signal.
In this paper, we propose a methodology for estimating the ionospheric contribution to the InSAR signal based on the azimuth pixel offset. The retrieved ionospheric contribution is then used to compute a correction that can we apply both to the correlogram and interferogram. We therefore propose a joint correction of the azimuth offsets and interferometric phases based on features observed on the correlation image.
The proposed method is used to improve our deformation maps on the Sichuan Eartquake.