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Integrated Data Processing Methodology for Airborne Repeat-pass Differential SAR Interferometry

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Abstract. Short temporal baseline and multiple ground deformation information can be derived from the airborne differential synthetic aperture radar Interforemetry (D-InSAR). However, affected by the turbulence of the air, the aircraft would deviate from the designed flight path with high frequent vibrations and changes both in the flight trajectory and attitude. Restricted by the accuracy of the position and orientation system (POS), these high frequent deviations can not be accurately reported, which would pose great challenges in motion compensation and interferometric process. Thus, these challenges constrain its wider applications. The objective of this paper is to investigate the accurate estimation and compensation of the residual motion errors in the airborne SAR imagery and time-varying baseline errors between the diffirent data acquirations, furthermore, to explore the integration data processing theory for the airborne D-InSAR system, and thus help to accomplish the correct derivation of the ground deformation by using the airborne D-InSAR measurements.

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