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A time domain along-track SAR interferometry method

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Differential interferrometric synthetic aperture radar (DInSAR) has already been proven to be a useful technique for measuring ground displacement at millimeter level. One major drawback of traditional DInSAR technique is that only the 1-D deformation in the slant range direction can be detected. In this study, a time domain along-track SAR interferometry method is proposed to extract the terrain deformation in the azimuth direction. Therefore, 2-D terrain deformation map can be obtained from one InSAR pair. Using traditional time domain back projection, the phase component corresponding to slant range direction offset can be estimated and removed from the range compressed signal. Then an along-track phase compensation is implemented to align the phase of the signal in the specified azimuth direction. Finally, the phase component in the along-track direction can be obtained by time domain coherent summation process. Comparing with the recently developed multiple-aperture interferometry (MAI), it has been found that the proposed method can utilize much larger aperture than the MAI process, which indicates that finer resolution and SNR can be acquired.

Biography

Ning Cao received the BS and MS degrees in electronic engineering from Harbin Institute of Technology, Harbin, China, in 2011 and 2013, respectively. He is currently at his second year working toward the PhD degree in Geosensing Systems Engineering in the Department of Civil & Environmental Engineering, University of Houston. His main research interests focus on multitemporal interferometric SAR techniques, and airborne SAR image processing.

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