

# Radar Ice Motion Interferometry

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## Abstract

When an interferogram is constructed from two 'repeat-pass' radar images, the fringe phases depend on both the local topography and any movement the surface experienced during the time between the passes. If either the interferometric baseline is small, or the topography is flat, the fringes clearly reveal the effects of the motion. If such is not the case, accurate topographic maps can be used to isolate the phase shifts due only to movement.

If topographic data are not available, however, we consider using a third repeat-pass, or a second repeat-pass pair, to measure the surface motion. It is possible to estimate the motion without having accurate baseline knowledge, and without knowing any of the topography. It is necessary, however, to observe reference points of zero, or negligible motion. In this paper, we present the technique, as applied to polar glaciers observed by ERS-1 and ERS-2 in the Tandem Mission.