Quality Measures for HRR Alignment based ISAR Imaging Algorithms

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Abstract

Some Inverse Synthetic Aperture Radar (ISAR) algorithms form the image in a two-step process of range alignment and phase conjugation. This paper discusses a comprehensive set of measures used to quantify the quality of range alignment, with the aim of 1) reviewing their benefits and shortcomings and 2) comparing their relative performance. Some quality measures may favour particular alignment techniques without adequately indicating improved alignment, so using multiple quality measures provide an added means of verifying the alignment quality achieved by any alignment technique. The sensitivity of the quality measures to slight misalignment of profiles and the effects of noise is also investigated.