

ISAR Imaging Using the Instantaneous Range Instantaneous Doppler Method

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Abstract— In Inverse Synthetic Aperture Radar (ISAR) imaging, the Range Instantaneous Doppler (RID) method is used to compensate for the nonuniform rotational motion of the target that degrades the Doppler resolution of the ISAR image. The Instantaneous Range Instantaneous Doppler method (IRID) is proposed in this paper as a tool that compensates for higher order phase terms that may degrade both, the slant-range resolution and the Doppler resolution of the ISAR image. In IRID, adaptive S-distribution was applied on both the slant-range and Doppler dimensions of the image, thus, producing a better focused ISAR image. The IRID method was applied to simulated and measured data sets, and the ISAR images show that the IRID results offer better visual ISAR images than the RID results.