

RF Interference Mitigation for UWB SAR using Image Sparsity

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Ultra-wide band (UWB) synthetic aperture radar (SAR) systems that use the VHF/UHF bands find civilian and military applications primarily due to the foliage penetration property of large wavelength RF waves.

A major problem for VHF/UHF SAR systems are radio, television and communications systems.

The presence of other systems can produce two types of radio frequency interference (RFI). One occurs when the SAR system interferes with other users. The second occurs when other users interfere with the SAR system.

The first type of RFI is strictly regulated and therefore certain specified bands must be avoided. The second type of interference occurs within the bands where transmission is allowed. Strong interference from other users within these bands, particularly from narrowband (AM and FM) transmitters, can deteriorate the dynamic range of the resulting SAR image.

In this talk we will propose a new SAR image formation algorithm which simultaneously produces a SAR image and also suppresses RFI, without introducing large range side lobes. The proposed method achieves this by leveraging the approximate sparsity of SAR images.