

COMPARISON OF PRECIPITATION EFFECTS IN SPACE-BORNE X- AND KA-BAND SAR IMAGING

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Abstract:

As the operating frequencies of SAR-systems are increasing, the visible distortions due to precipitation in SAR-images are becoming more frequent. This holds especially for the case of convective rain events. The German space-borne satellite TerraSAR-X has delivered a series of measurement examples, which were used to study precipitation effects in SAR-images. Based on these valuable data takes and simultaneous weather radar measurements, a quantitative estimation of precipitation effects in SAR-images is presented.

In a further step, an attempt is made to extrapolate the observed effects to systems operating at higher nominal frequency-bands, i.e. Ka-band, being taken under consideration for future SAR-systems. The effects of backscattering and attenuation will be investigated. Furthermore the likelihood for precipitation effects in SAR images at Ka-band will be addressed.

Keywords: Synthetic Aperture Radar (SAR), Microwave imaging, Propagation effects, Signal Attenuation, Precipitation