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THE EFFECTS OF NOISE ON POLARIMETRIC SAR DATA

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ABSTRACT

Polarimetric SAR data can provide a great deal of information about the scattering behavior of the surface under observation. Polarimetric SAR systems often measure the scattering matrices of the areas under observation in linear polarizations (H and V). From the scattering matrix commonly used forms such as the covariance matrix and the Stokes matrix can be easily derived. Other measures derived from polarimetric SAR data include the standard deviation of texture, correlation coefficients between scattering matrix terms, and the mode and variance of phase diffferences between scattering matrix terms. The effects of additive system noise on these measurements is not often considered in the literature on this subject,

in this paper, the effects of additive system noise on measurements derived from polarimetric SAR data will be examined. It will be shown how first-order noise effects can be removed and how second-order noi sc effects can be reduced for some measurements. Some commonl y occuring character sties of polarimet ric SAR data which may be attributed to noise, such as the pedestal on a polari zation signature, or a broadeneing in the distribution of the HH-VV phase difference over an area, or a reduction in the magnitude of a correlation coefficient, will be identified.

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Kewords: Polarimetric SAR, Data analysis