

Comparison of methods for estimating tree height using polarimetric interferometry.

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At present, a consensus seems to be emerging as how to estimate tree height using a suite of interferometric measurements, possibly obtained polarimetrically. The benefit to polarimetry is in the fact that the balance in scattering mechanisms is altered by a change in the polarization state without changing additional parameters such as frequency, which likely would introduce additional unknowns that are not of particular interest, but nevertheless must be solved for to achieve a proper inversion. With a single set of fully polarimetric set of measurements, we have the ability to synthesize any combination of polarizations that we choose, and thus have the option of transforming the observed data prior to solving for the unknowns of interest (in this case tree height). One such approach is to use a set of polarizations optimized with respect to correlation magnitude, while another may be to use the Pauli basis or even the principal polarizations of [vv, hh, and hv]. This talk will discuss the tradeoffs and benefits involved in making such transformations by formulating the question using Bayes' rule coupled with a physical scattering model.