

Probing Polarization to Assess the Cuticular Condition of a Terrestrial Canopy

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This study presents an empirical study of the polarized-light phenomena on a leaf surface under the laboratory condition, using a Liquid Crystal Tuneable Filter (LCTF) camera with a linear polarizer filter attached on front of its lens and were rotated to obtain the degree of polarization (DoP) of the target. The instrument was capable to capture the spectrum between 460nm to 780nm with the step of 10nm. The experiment was focused to capture the specular reflectance from the surface of the leaf, thus we set the angle between the light source and the sensor always in mirror angle. Several different leaves with distinct different feature on its surface were observed in a dark-room laboratory and outdoor measurement. Results show that a polarization measurement is capable to distinguish changes on the drought-stress plant, thus it remains a key component of the remote sensing probe to understand the vegetation cuticular condition, and in a broader range, terrestrial canopy.

Keywords: Degree of Polarization, Drought, Hyperspectral, Forest Canopy, Specular Reflection

