



A Novel Method for Assessment of Light Transmissivity in Forest Canopy from Full-Waveform Airborne LiDAR Data

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Air- and space-borne 2D imaging in visible and infrared domain of electromagnetic spectrum have been proven to be a reliable remote sensing techniques for forest monitoring and mapping. However, in contrast to the ranging techniques, 2D imaging over forest can not distinguish backscattering contributing from scattering elements at different ranges, e.g. from the forest canopy and the forest floor. Light transmissivity is a wavelength and directionally depended physical parameter which quantifies loss of light while traveling through forest canopy, and thus, figures as a parameter in radiative transfer models when the scattering from these forest components should be quantified. This work proposes a novel method to derive the transmissivity of forest canopy based on small-footprint, full-waveform airborne LiDAR data. The method explores the energy balance at the ground boundary in the water cloud model applied on individual Gaussian clusters. The transmissivity map derived by the method proposed showed plausible results in comparison with orthophotos and ground images.