Global Sensitivity of Canopy Structure Parameters on Canopy Reflectance Model in Winter Wheat

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Sensitivity analysis (SA) is the first step of model simulation and inversion. In the paper, local and global sensitivity analysis (SA) methods were compared to demonstrate how the choice of SA method leads to the differences in the quantification of the relative importance of model parameters in driving canopy reflectance variability. Using the Extended Fourier Amplitude Sensitivity Test (EFAST) the global SA on canopy reflectance model was performed, while the local SA was calculated based on a series of simulations by perturbing model input parameters sequentially. Canopy reflectance was simulated using the ProSAIL model and the input parameters are referred to the field observational data which were collected in Beijing suburb during the growing stage of winter wheat in 2005-2006. As for the magnitude of the importance, the rank importance of model input parameters, some pronounced differences were found between the two methods. So does the vegetation indices (VIs) and wavelengths at which model parameters are most important in explaining reflectance variability.

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