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Spatial-scale prediction of soil vegetation atmosphere transfer (SVAT) soil hydraulic variables characterizing stratified soils from an ensemble kalman filter (EnKF) analysis of synthetic aperture radar (SAR) surface soil moisture

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This study will report on the application of remote sensing on estimation of soil and hydraulic properties. Because uncertainties and errors in land surface models arise from land surface parameters based upon the empirical formula limited to validation sites, an inversion approach for estimating soil parameters is suggested to accommodate vertical and spatial heterogeneity. As compared to the approach using formulations or repeated calibrations, this approach has the merits in that there is no need to define or formulate soil conditions, and there is no scale issue between local observations and spatial scales. Data will illustrate that it is possible to acquire the appropriate level of spatial distribution in soil hydraulic properties, resulting in better simulation of soil moisture. It will be also discussed how to improve the quality of remote sensing data, and its impact on pedology estimation. Several discussions on available soil maps, and their limitations will be provided.

Biography

Ju Hyoung Lee is a Research Professor at the Seoul National University. She mainly deals with soil moisture, a key variable in water cycle and ECV (Essential Climate Variable). Her expertise lies in a stochastic approach in removing satellite retrieval errors. With respect to this topic, she recently published a review paper titled "Stochastic Bias Correction and Uncertainty Estimation of Satellite-Retrieved Soil Moisture Products" to *Remote Sensing Journal*. It was the innovative and distinguished research that casts an argument on whether the errors are estimated by relative difference or independently estimated from self-perturbing the algorithm, and suggests a novel perspective of probabilistic retrievals by discovering the power of Gaussian distribution. She is also discovering the unknown mechanism of interactions between soil moisture and rainfall using satellite observations and models as well as data assimilation techniques.

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