

# **A Framework of a Remote Sensing Data Assimilation System**

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Estimating environmental variables from satellite observation is often an ill-posed inversion problem. There are currently multiple satellite sensors available for monitoring land surface environment and people have developed many different algorithms for estimating one particular variable, however, the land surface products provided by the space agencies are usually derived from observations of one satellite using only one algorithm. We are developing a prototype remote sensing data assimilation system. The general idea is to develop a forward, largely radiation transport, model calculation with parameters that are adjusted to optimally reproduce the multispectral and multiangular radiances observed by multiple satellite sensors. Such adjustments are usually made by identifying reasonably close “first guesses” for the model parameters based on the current land products and determining statistically optimum estimates of the parameters by giving appropriate weights to the first guesses versus addition of the error increments needed to get agreement with the observations. The general framework consists of four modules: a knowledge database, radiative transfer modeling, data assimilation algorithm, and sensor characterization. The general methodologies and some preliminary results will be presented.

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