



**Climate Program Remote Sensing Workshop
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SPEAKER TITLES/ABSTRACTS

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“Incorporating Spatial Dependence in Atmospheric Carbon Dioxide Retrievals from High-Resolution Satellite Data”

Earth-orbiting satellites that monitor atmospheric greenhouse gases, such as NASA’s Orbiting Carbon Observatory-2 (OCO-2), collect measurements of reflected sunlight at fine spatial and temporal resolution. The atmospheric constituent of interest, such as carbon dioxide (CO₂) concentration, is estimated from these observations using a retrieval algorithm. A particular class of retrievals can be represented as hierarchical statistical models, and inference for the atmospheric state is achieved through the posterior distribution given the observed satellite radiances. The spatial retrieval subgroup will present an investigation of multi-pixel retrievals that combine nearby satellite observations for joint inference on a spatial field of atmospheric states. We illustrate the impact of true and assumed spatial dependence for different atmospheric variables and discuss needs and capabilities for a distributed approach to this spatial retrieval.