Zhe
Feng
Pacific Northwest National Laboratory
Joseph Hardin, Pacific Northwest National Laboratory
Hannah Barnes, Pacific Northwest National Laboratory
Jianfeng Li, Pacific Northwest National Laboratory
Ruby Leung, Pacific Northwest National Laboratory
Adam Varble, Pacific Northwest National Laboratory
Zhixiao Zhang, University of Utah
Oral
(Virtual Talk)
We introduce an open-source software package called PyFLEXTRKR (Python FLEXible object TRacKeR, Feng et al. 2023), which uses object-based algorithms to track features. It specializes in tracking convective clouds in a diverse range of observations and models from large-eddy simulations (LES) and convection-permitting models (CPMs) to global climate models (GCMs). PyFLEXTRKR has a modular design that makes it easy to adapt to tracking features at various resolutions, with scalable parallelization that can be run on laptops or high-performance computers. We demonstrate examples of convective cell tracking in radar observations and LES outputs, and mesoscale convective system (MCS) tracking in satellite observations, CPMs, and GCMs. Visualizations and statistical analysis tools included in PyFLEXTRKR that facilitate model-observation comparisons and process-level understanding will be showcased. Overviews of our recent usage of PyFLEXTRKR to develop unique datasets, including the CACTI field campaign convective cell tracking database (Feng et al. 2022) and high-resolution MCS tracking databases (Feng et al. 2019; 2021), will be provided.
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