

## **Do shallow cumulus clouds and convective plumes share the same statistics?**

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When studying the spatial organization and size distribution of shallow convection, the most widely looked at characteristic is the 2D projected cloud field. This approach has many practical benefits. 2D cloud fields can be easily detected with high precision from satellite or aerial retrievals, and generating a 2D cloud mask from model output is trivial. There are some drawbacks though. Firstly, clouds can not provide information on dry convection. And secondly, while cumulus clouds are closely linked to convective plumes there is no direct relationship between cloud and plume size, nor is it guaranteed that the number of clouds and plumes are the same. In this poster we will compare the statistics of the 2D projected cloud field against those of the 3d convective plumes in a month's worth of LES simulations over the southern great planes ARM research facility. The 3D convective plumes are diagnosed from the LES output fields with the help of a surface emitted tracer which decays over time. We will specifically look at size distribution and spatial organization, in order to estimate how well the 2D cloud fields serve as a proxy for the 3D plumes.

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