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Exploring the Influence of the Duration of Aerosol Perturbations on Cloud Responses

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High-resolution modeling of aerosol-cloud interactions typically applies aerosol perturbations for the duration of the simulation, which may be anywhere from a few hours to a few days.

In reality, however, natural and anthropogenic aerosol perturbations have characteristic durations, along with concomitant changes in meteorology and associated cloud conditions. In this talk we will explore the effect of the duration of aerosol perturbations on the cloud radiative responses using idealized large eddy simulations. We will also consider observed seasonal cycles in meteorology, clouds, and aerosol, and how they affect cloud albedo responses. These exercises will help to assess the radiative effect of aerosol-cloud interactions.