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Interaction between biomass-burning aerosol and clouds under different climate/weather regimes

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The maritime continent in Southeast Asia is characterized by the frequent convective activities on a wide range of scales, as well as by the seasonal emissions of biomass-burning particles. The emission of biomass-burning particles in this region typically peaks in September and October, whereas its intensity varies considerably from year to year. Since the atmospheric circulation over the region is heavily influenced by a range of meteorological and climatological variabilities, such as ENSO, it is important to quantitatively examine the impacts of biomass-burning particles on clouds while taking weather/climate regimes into account. We investigate the effects of biomass-burning particles on clouds, especially convective ones, with cloud-resolving simulations by the WRF-CHEM model. Instead of focusing on a particular case, our simulations cover an extended period of time in the month of September, allowing us to examine both individual convection and an ensemble of convective clouds developing under different weather/climate regimes and hence different aerosol abundance and distributions. Such long-term and high-resolution simulations over the region will give us an insight into the climate-regime dependent two-way interaction between aerosols and clouds.