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Modelling Marine Stratocumulus and its Radiative Properties

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The radiative properties of marine stratocumulus, which cover large regions and affect the global climate, are influenced by the presence of drizzle, aerosols, and the entrainment of warm dry air from above the cloud layer. VOCALS, the VAMOS Ocean-Cloud-Atmosphere-Land Study, is examining the climate system of the southeast Pacific to reduce uncertainties in current and future climate projections, especially those associated with marine stratocumulus and coupled ocean-atmosphere processes. As part of VOCALS-UK we are investigating the small-scale structure and microphysics of marine stratocumulus, and hence its radiative properties, by using the UK Met Office Large Eddy Model to perform sensitivity studies, with the model's standard microphysics scheme and with the new Morrison microphysics scheme. The model simulations are validated against measurements from the BAe-146 research aircraft obtained during the VOCALS field campaign over the southeast Pacific in October and November 2008.