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Impacts of Ocean Waves on the South China Sea Monsoon Onset

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A regional climate model developed in Nanjing University is coupled to the WAM ocean model, using the sea-state dependent roughness parameterization. The coupling process involves dynamic interactions through the air-sea momentum flux as well as thermal interactions through air-sea heat fluxes. Dynamic interactions remove momentum from the atmosphere and transfer it to ocean waves and currents, tending to decelerate the atmospheric motions. Thermal interactions pass latent and sensible heat from the ocean to the atmosphere, which can intensify atmospheric motions. Numerical experiments with the coupled atmosphere-ocean wave model system show that the ocean waves play an important role in the process of the South China Sea monsoon onset. The dominance of the thermal interaction over the dynamic interaction is favorable for the South China Sea monsoon onset.

Keywords: Atmosphere-ocean waves coupling, South China Sea Monsoon, Dynamic and thermal interactions.