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Improvement of radiation fog prediction using recent development of turbulence closure parameterizations

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Fog is an elusive process with complex interplay of surface energy balance, thermodynamic, radiation, microphysics, and turbulence. Consequently, fog predictions require high-resolution models and detailed physical parameterizations. A study using the regional Eta model driven by ECMWF ensemble has been conducted to investigate formation, evolution, and dissipation of radiation fog over plain terrain. A series of sensitivity tests of turbulence closure schemes on prediction accuracy for a case study was verified based on data about liquid water content, temperature and wind speed. Preliminary results show that the improved formulation of the turbulence length scale calibrated using large-eddy simulation significantly improves prediction accuracy. This length scale increases realistically for decreasing stability which is crucial for conditions conducive to fog formation.