



Necessity of parameterizations for convective initiations in high resolution cloud permitting models

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Recently, some of NWP centers in the world, including the Japan Meteorological Agency (JMA), launched operations of high resolution cloud permitting models with horizontal grids spacing around 2-km employing no convective parameterizations. When convection is properly activated in the model, significant part of vertical transport is resolved using their prognostic vertical velocity. However, models often suffer from initiation of convection even if unstable stratified layer is generated, which could lead to delay and position error of convection. It is found that convective initiation highly depends on high frequency mode which cannot be well resolved, and that small scale phenomena to force parcels lifted to overcome an energy barrier (referred to as CIN) and initiate convection should be parameterized.

We will show how the problem appears in our model and give some suggestions to resolve it.