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Assessment of the impact of hygroscopic seedingover the Korean Peninsula using the WRF model with hygroscopic seeding parameterization

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Numerical models essentially important in assessment of cloud seeding experiments due to the limitation of field observations. For this reason, in this study we devise a method to parameterize hygroscopic flare (CaCl2) seeding process and apply it to simulate hygroscopic seeding experiments in the Korean Peninsula, using WRF (Weather Research and Forecasting model). In detail, activation of hygroscopic seeding material is calculated either inthe droplet activation processorin the auto-conversion process ofMorrison microphysics scheme, depending on the size of hygroscopic flare particles: in the activation process fordiameter of flare particles smaller than 10μm and in the auto-conversion process otherwise. Using this modified scheme, we simulated some seeding experiments thatwere conduct by the National Institute for Mathematical Sciences (NIMS) of South Korea. To enhanceunderstanding of the precipitation mechanism, weanalyze the impact of the hygroscopic seeding on microphysical processes such as activation and auto-conversion.Moreover, we attempt to quantify the seedability of hygroscopic seeding in the Korean Peninsula.Finally, we will try to suggest guidelines for optimal precipitation enhancement experiments. Detailed results will be discussed at the meeting.