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Comment on acp-2022-405

Anonymous Referee #1

Referee comment on "Aerosol–cloud interaction in the atmospheric chemistry model GRAPES_Meso5.1/CUACE and its impacts on mesoscale numerical weather prediction under haze pollution conditions in Jing–Jin–Ji in China" by Wenjie Zhang et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2022-405-RC1, 2022

This paper is the first to investigate the impact of aerosol-cloud interactions on weather by using the operational NWP model from the China Meteorological Administration, which is important for more accurate weather forecast in China. There are some concerns that should be addressed.

Main comments:

- The cloud droplets nucleation is a bridge connecting aerosol and cloud droplets and this is also the key of this paper. I think how cloud droplets nucleation is parameterized should be added to the manuscript or supporting material in detail.
- Is the increase or decrease in precipitation only due to snow melting?

Minor Comments:

- The weather stations in Figure 1 are not marked clearly.
- The fonts of some units need to be unified, such as the unit in line 289.
- In line 104, ‘Number’ >> ‘number’.
- Some abbreviations and symbols should be checked throughout the manuscript.
- The sentence in lines 124-127 needs to be reorganized.
- I think ‘in NWP model’ in line 55 is duplicated.

- In line 241, ‘additional new cloud’ is not accurate and leads to a misunderstanding. Maybe change this to ‘additional cloud field’ or ‘additional cloud’.