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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Effects of long-range aerosol transport on the microphysical properties of low-level liquid clouds in the Arctic" *by* Q. Coopman et al.

Anonymous Referee #2

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This work uses a variety of tools (satellite, transport model, meteorological datasets) to examine effects of pollution on cloud microphysics over the Arctic between 2008 and 2010. The authors quantify values for a parameter many have studied in the past, called "Indirect Effect (IE)" (or sometimes ACI) with values ranging from 0 to 0.34 when using drop effective radius. The IE value increases with specific humidity and lower tropospheric stability, and it is highest when pollution is low and may also depend on the source of pollution. They also conclude that at fixed meteorology, LWP doesn't respond strongly to pollution. The topic is of interest to the journal and is of importance owing to the uncertainties linked to aerosol-cloud interactions. The paper is written and organized well. The methods are solid. The conclusions are supported by the

data. The title adequately reflects the contents of the manuscript. The only reservation I have about the paper is that it is one of so many about IE and thus the amount of new knowledge contributed by each subsequent paper is limited; however, the data come from a region that requires more research and thus it is worthy to archive the results in this journal. I recommend publication.

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