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Interactive comment on "The potential of polarization measurements from space at mm and sub-mm wavelengths for determining cirrus cloud parameters" *by* J. Miao et al.

J. Miao et al.

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Thank you very much for your helpful comments. The paper will be accordingly modified later.

You are completely correct in raising questions on the effect of multiple scattering and the virtue of polarization measurements at multiple frequencies in points 4 and 5 of your specific comments. Our understanding is that, in general, we should expect a linear increase of Q as cloud IWP increases from zero to a certain amount, from where on multiple scattering effect begins to be significant. Beyond that amount of IWP, Q should gradually approach its saturation limit. In this process the position of the resonance peak may change due to changes in cloud optical depth with cloud particle sizes, even for the same IWP. One of the virtue of multiple frequency measurements is that, if the

frequencies are properly selected, we should be able to keep the measurements within the linear regime of radiative transfer at least in one or two frequencies. And this will significantly facilitate our retrieval of cloud parameters.

Interactive comment on Atmos. Chem. Phys. Discuss., 2, 1403, 2002.