

Interactive comment on “Esrangle lidar’s new pure rotational-Raman channel for measurement of temperature and aerosol extinction in the troposphere and lower stratosphere” by P. Achtert et al.

Anonymous Referee #2

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This manuscript presents interesting new capabilities to derive temperature with lidar including the lower stratosphere with the rotational Raman technique simultaneously with PSC detection. While this technique is not new, such systems in the Arctic region are not numerous and will be a great tool to study the ice cloud formations. The temperature is a crucial parameter and so the development of such instrumental tool is important for the physics of the PSC. The manuscript describes clearly the new instrument as well as the scientific issues, that are topics well adapted for the AMT journal

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and should be published. The manuscript correctly describes the both critical issues of elastic signal rejection and calibration. However, I recommend to add a specific discussion on radiosonde uncertainties while it is crucial for PSC investigations, it is important to cover this issue. For the calibration issue, while the method is convincing, authors should give some references and highlight the fact that radiosondes have their own uncertainties that are not always negligible (instrumental and spatio-temporal origins) mainly in polar region. Also radiosonde types are useful information that can be added. This is a critical issues while the next step will be to derive correlations between temperature and PSC occurrence as stated in the conclusion. In the conclusion, author should discuss how they will handled the potential temperature uncertainty linked to the calibration and uncertainty of radiosonde measurements.

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