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Atmospheric Measurement Techniques Discussions

Interactive comment on "Channel selection method for hyperspectral atmospheric infrared sounder using AIRS data based on layering" *by* Shujie Chang et al.

Anonymous Referee #2

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General comments: The paper proposes an effective channel selection method for a hyperspectral atmospheric infrared sounder using AIRS data based on layering. The newly developed method is compared with two different channel selection methods and provides there an improvement in the retrieval temperature at about 1 K between 20 – 100 km. Statistical inversion comparison experiments based on AIRS data indicate that the standard deviation of atmospheric temperature can be optimized. The authors gave examples for different regions and explained the improvement of the new channel selection method. They explain the importance of the atmospheric layer in the altitude range 20 – 100 km and the importance of an improved channel selection method for this region.

Specific comments: - Explain the abbreviations ICS, NCS and PCS in the abstract. - p. 21, l. 429: Include the following citation: Saunders, R., Hocking, J., Turner, E., Rayer, P., Rundle, D., Brunel, P., Vidot, J., Roquet, P., Matricardi, M., Geer, A., Bormann, N., and Lupu, C.: An update on the RTTOV fast radiative transfer model (currently at versionÂă12), Geosci. Model Dev., 11, 2717–2737, https://doi.org/10.5194/gmd-11-2717-2018, 2018. - p. 21, l. 429-430: The sentence "RTTOV is an evaluation of RRTOV v11, adding and upgrading many features" should be removed because explained is only the common procedure. - Table 1 and table 2 should be removed or shifted to the appendix. - p. 44, l. 747-748: Description of figure is too universal. Please specify the behavior in more detail.

Technical comments: - p.3, l. 65: Atmospheric Infrared Sounder → Atmospheric InfraRed Sounder - p. 14, l. 302: bright → brightness - p. 16, l. 327: bright → brightness - p 26, l. 495: add last access date - p. 29, l. 528: bright → brightness - p. 38, l. 644: add last access date - p. 39, l. 656: Do not write and so on. Either specify the variables or stop the sentence after cloud information. - p. 39, l. 664: add last access date - p. 40, l. 674: Do not write etc. Either specify the variables or stop the sentence after wind speed. - p. 51, l. 872: at 4.3 μm

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