

Review of amt-2023-242

GENERAL

This is detailed and invaluable work and digs deep into the calibration problems associated with orbiting FTS radiometers. Some questions that arise from the easy standpoint of someone who doesn't have to do it are given in the following detailed commentary section.

COMMENTARY

line: comment

14-19: Note that laboratory data are almost always taken with the gases at thermal equilibrium. In reality, the nonlinearity of the atmosphere means that temperatures and line shapes are not at LTE. See *Meteorology* **2023**, 2(4), 445-463; <https://doi.org/10.3390/meteorology2040026> and references therein.

45-55: Self-absorption in many atmospheric rovibrational transitions means that the wings are relatively more important than in an equilibrated laboratory sample. In the real atmosphere with non-LTE, that may pose problems for satellite FTS retrievals.

119 et seq: I have assumed that the equations in Section 2.2.1 are correct.

192-200: I note that J W Brault developed an interferometer wherein only the 'perfect' configurations were selected. The improved signal-to noise was such that commercial manufacturers adopted it (it was not patented). Of course, that is irrelevant for interferometers already in orbit - or can software be developed?

291-305: How does non-LTE in the atmosphere affect this?

323-325: Again, how does non-LTE play in this problem?