

***Interactive comment on “Probability density functions of long-lived tracer observations from satellite in the subtropical barrier region: data intercomparison” by E. Palazzi et al.***

**Anonymous Referee #1**

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This study uses several different long-lived trace gases from satellites with different resolution and sampling characteristics to characterize transport and mixing in the stratosphere, with emphasis on the subtropical transport barriers. Similar studies have been done before, as the authors note, but the present work is more comprehensive and uses a methodology that allows these different observations to be processed in the same way. The authors address one of the challenges in studying a particular atmospheric phenomenon using data with different spatiotemporal sampling characteristics, that is, finding a method that accommodates those differences in the simplest possible way. The statistical approach adopted here is straightforward, the authors give a good overview of the different instruments and understand the sampling issues, the topic is

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well-researched and the paper is very nicely written. The topic of characterizing transport barriers from observations is important guidance for models which seem to still have difficulties getting this right.

The only minor comment is that in Fig. 2 I think the authors mean seasonally averaged, not annual mean.

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