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Interactive comment on "Sensitivity of stratospheric Br_y to uncertainties in very short lived substance emissions and atmospheric transport" *by* R. Schofield et al.

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Original text: **Referee 4 suggests that Schofield et al. should test the realism of the ERA-Interim convective detrainment rates. Clearly, there are potentially large uncertainties in the detrainment rates and, as Schofield et al. state, the uncertainty is difficult to quantify. In addition to the referee's suggestion, I would like to note that in Aschmann et al. (2009) we did compare the tropical mean convective turnover time (inverse of the detrainment rate) from ERA-Interim with estimates from Dessler et al. (2002), which were based on measurements of CO and ozone. Somewhat surprisingly, we found excellent agreement between**

ERA-Interim and Dessler's estimates of the tropical mean

We thank B.-M. Sinnhuber for his short comment, we add the Aschmann et al., [2009] turnover rate comparison with Dessler, [2002] to the discussion were we state that the detrainment rate uncertainties are difficult to quantify and discuss work that has been conducted in this direction. As we note in our response to reviewer 4, the approach of Aschmann et al., [2009] which considers a direct product of the detrainment rates is such an approach that will aid in reducing this uncertainty. A future study would require a full seasonal (preferably, source region dependent) assessment, to further improve our confidence in the use of the detrainment rate product from ERA-Interim.

References Aschmann, J., B. M. Sinnhuber, E. L. Atlas, and S. M. Schauffler (2009), Modeling the transport of very short-lived substances into the tropical upper troposphere and lower stratosphere, Atmospheric Chemistry and Physics, 9(23), 23, 9237-9247, doi:9210.5194/acp-9239-9237-9200.

Dessler, A. E. (2002), The effect of deep, tropical convection on the tropical tropopause layer, Journal of Geophysical Research-Atmospheres, 107, D3, doi:10.1029/2001JD000511.

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