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Interactive comment on “Dynamical characteristics of ice supersaturated regions” by K. Gierens and S. Brinkop

Anonymous Referee #2

Received and published: 5 October 2012

From many other papers we know that ISSRs are an interesting phenomenon in the upper troposphere with a possible impact on the circulation. In this study the subtropical and European region are examined in order to provide statistical material for their existence in relation to dynamical parameters. The main finding is that for anticyclonic flow ice supersaturation is often observed. A disadvantage is the restriction to one specific month of March 2012. Further the dynamical parameters are not related to the direct movement of the air mass.

I recommend this manuscript for publishing in ACP only after major revisions.

Major revision:

M1 – In the Introduction the authors are saying what they want to study, but the moti-

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vation is missing. For instance, why is it important to study ISSR in details using such a statistics of higher moments? I expect to read some clear argument/ facts and the development of some questions where the answers are not known so far or never been studied before.

M2 – Further this one-month-study of March 2012 with an updated/ new IFS cycle needs a complete explanation in relation to the ISSS performance, its changes in comparison to the old one! Here I also miss the motivation, why only using March 2012 not 2011 and the years before or other months? Is March 2012 extraordinary?

M3-As dynamical parameters divergence, vorticity and omega are used in combination with relative humidity (ISSR) or not. I wonder whether this is really appropriate, as a first guess ok, but why not using Ertel's potential vorticity and temperature and specific moisture, and further take into account time shifts or trajectories in order to capture the development during the evolution.

M4- These anticyclones over western Europe are often related to poleward breaking Rossby waves with warm and moist conveyor belts on its western flank which have often formed high cirrus clouds in the upper troposphere. They may be important for ISSS formation too. This point should be included in the discussion. On the other hand the discussion & interpretation part seems to me is to long and needs more focusing. Some parts could be put into the Introduction.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 19871, 2012.

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