

## ***Interactive comment on* “New-particle formation events in a continental boundary layer: First results from the SATURN experiment” by F. Stratmann et al.**

### **Anonymous Referee #1**

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This MS reports interesting results on the meteorological and physical situation during the time of new particle formation inside the PBL. The paper gives an overview and first results of the intensive measurements that took place in the SATURN experiment in Leipzig, Germany.

The process of atmospheric nucleation is still not completely understood and especially measurements above the ground inside the BL are urgent needed to disclose these secrets. Further the small synoptic scale monitoring of particle formation events show quite clear the over regional dimension of the phenomena. Therefore, the MS fits to the scope of ACP and should be published after minor revisions.

Comments and suggestions:

The authors gave in chapter 1 and 2 detailed descriptions of the instrumentations and the sites. It would be also very interesting for the readers to continue in this way and include in a short sub-chapter or table the number, date, time, height etc, of the balloon-borne measurements carried out during the experimental period.

In chapter 4.1, Fig. 10 the first peak of the newly formed particles around 8 UTC correlates with a peak of SO<sub>2</sub>, however the second peak of delta N starts when SO<sub>2</sub> has a minimum around 9 UTC and stops long before SO<sub>2</sub> reached its second maxima. It seems more that the second peak of delta N correlates with the disturbing of the solar radiation through the appearance of the cumulus clouds and not with the second increase of SO<sub>2</sub> concentration (page 1706, line 10).

On page 1708 (line 1-3) the authors claim a SO<sub>2</sub> minimum at the same height (300 m) of the delta N minimum. However, Fig. 12 shows the minimum of SO<sub>2</sub> at a height from 200 to 250 m and a SO<sub>2</sub>-increase inside the IL. So the similar behavior of SO<sub>2</sub> and delta N in this height interval should be reconsidered.

Page 1709, line 10-14 the authors suggest that between 8.43 and 9.05 UTC no particle formation inside the RL took place. However, in page 1708, line 10-11, two hours earlier he claimed new particle formation in the RL as the result for the observation of particles in the size range 5 to 10 nm. Further the vertical profile during the second balloon flight stopped at the inversion height. So, no measurements inside the RL were available during this flight. It would be good to reconsider the conclusion about nucleation processes inside the RL again (also in the summary).

In the end I want to encourage the authors to give for example in the summary some outlook, if the observed interesting particle formation appearance in the PBL on the 3rd of June 2002 was also observed on other event days. This means only a general preview (no data or measurements) of the results which hopefully will be published soon.

Technical corrections:

Page 1694, line 1: 4 June change into 14 June

Page 1695, line 27: apart from to the balloon site.

Page 1710, line 17: typical radiation day, it would be better to explain it in a more clear way

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Interactive comment on Atmos. Chem. Phys. Discuss., 3, 1693, 2003.

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