

Interactive comment on “New particle formation at urban and high-altitude remote sites in the south-eastern Iberian Peninsula” by Juan Andrés Casquero-Vera et al.

Anonymous Referee #1

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This manuscript attempts to study NPF events at two contrastive sites, i.e., urban and high-altitude remote sites within 20 km distance. The authors found that NPF was associated with the transport of gaseous precursors from lower altitudes, always observed from the smallest measured sizes and had a higher growth rate of newly formed particles at the high-altitude site. They also analyzed the contribution of sulfuric acid in particle growth, the importance of CS and availability of VOC in NPF events. In my opinion, the paper is generally well-written and suitable for publishing in ACP. A few minor comments are listed for the authors considering.

1) Page 3, lines 3-10, the authors are encouraged to cite the papers, in which the

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contributions of NPF to CCN at specific supersaturations were measured directly. 2) Page 7, the bottom paragraph and Page 8, the top paragraph, the reviewer gets lost by the comparison presented here. The similarity and difference between the contrastive sites in literature should be compared with the findings in this study, correct? 3) Page 9, lines 13-15, “For many years, it was thought that NPF events cannot take place in heavily polluted urban areas, since the high condensation sink (high pre-existing aerosol concentration) in these areas was considered detrimental in suppressing the formation and growth of particles”, What situation is “heavily polluted”, please add a quantitative definition. 4) Page 10, lines 28-29, “This fact could have a special importance on cloud formations, since larger GR at SNS mountain station could be translated to larger survival probability of NPF particles to reach CCN sizes, due to shorter time needed for the growth.” This is not necessarily true by considering the ceiling of particle growth from 10 nm to CCN size or even particle shrinkage, e.g., Man et al., EST, 49, 7170-7178, JUN 16 2015. 5) Section 3.3, the aerosol acidity and aerosol phase state may also affect the growth rate of newly formed particles, please add the analysis if possible. 6) Page 13, lines 15-24, the reviewer has the same concern as presented comment 3 7) Section 3.5, no direct measurements of sulfuric acid vapor are one of major weaknesses here, and the weakness should be added.

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