Atmospheric
Chemistry
and Physics
Discussions

Open Access

EGU

Interactive comment on "Refined classification and characterization of atmospheric new particle formation events using air ions" *by* Lubna Dada et al.

Anonymous Referee #2

New particle formation has been demonstrated to play important roles in air quality and climate change. It's essential to classify the new particle formation events and non-events days accurately that can reduce the uncertainty when evaluating the contribution of NPF to aerosol and CCN budget. Previous methods were kind of subjective, and resulted in a poor comparability. This study present an automated method, which is more objective, to classify days into four categories including NPF events, non-events and two classes in between. This automated method was applied in a 10-year NAIS dataset at SMEAR II station. The classification using this methods almost matched the original method, but provided more reliable categories. Therefore, this automated method has the potential to be promoted widely. The manuscript is overall well written

and documented. The topic fits well in the scope of ACP. I recommend this manuscript can be published after some revisions.

Comments

1. A NAIS is needed to use this "new" method, which is not easy to be promoted. Can it be used with a SMPS or a DMPS? Hyde have SMPS/DMPS dataset, did the author compare the results that using a NAIS with a SMPS/DMPS? Are they identical?

2. Line 154-156: definition of region events is "initiated over a large area including the measurement location and the particles continue to grow to bigger sizes". Since the SMEAR II station is a surface measurement site, how did the author make sure the identified "regional event" occurred over a large area?

3. Transport events, is there any more evidence to support the definition? Any other possibility that other sources but not NPF contribute to the 7-25 nm particle?

4. Nighttime events: there are some regional events those were started and stopped before sunrise (Fig. 6)? Is it mean they are typical nighttime NPF events? Did they have the "banana" shape? If not, it means these events were not class A event, but still be defined as regional events (see comment 2)?

5. Figure 2: it's better to give an example to show the variation of 2-4 nm particles and 7-25 nm particles in one event.