Review on Effect of planetary boundary layer evolution on new particle formation events over Cyprus

General comments:

The paper investigates effect of planetary boundary layer evolution on new particle formation events over Cyprus using the measurements at two measurement sites at different altitude. It also used ceilometer and water vapor passive trace to indicate the boundary layer evolution. The study is in general well written and provide a meaningful contribution to the knowledge of the boundary layer driven NPF events.

Two aspects are my main concern. Firstly, it still not very clear, at least not so quantitatively, assets the boundary layer mixing process on NPF events. I suggest the author to calculate the time lag for each concurrent events and compare it with time needed for boundary layer increasing from AMX site (532 m) to TRO site (1819 m). It would be better to quality this effect. Secondly, there are lots of previous work was mentioned in discussion part, I suggest the author to move some of them into introduction part.

Specific comments:

- line 220: “We used two approaches to examine the influence of PBL evolution on the occurrence of NPF 219 events at the mountain background site, TRO. AMX is assumed to be in the PBL at all times.” You mean you used two method to judge whether the TRO within boundary layer? Also, the sentence is a litter bit confuse as you are talking about TRO and suddenly mention AMX. Please consider to rearrange it.

- line 236: Please move this sentence line 238 “under stable conditions”, and rephrase this sentence “The PBLH from ERA5 is realistically…”

- line 244: Please keep consistent for “ERA5” but not “ERA-5”.

- Figure 3: Part of it was hidden.

- line 344: “sustained wind speed” → confusing

- line 346-348: Please be careful that sun photometer measurement the total columns of aerosol from ground to top of atmosphere. The integration path of AMX is longer than TRO. In addition, the contribution of AOD was dominated within boundary layer. It’s obvious that AMX larger than TRO, so I did not get useful information here.

- line 148-351: Large AE at TRO site means smaller particles there. Most large particle would be concentrated at low altitude due to gravity effect but not NPF effect. How did you remove the effect of gravity effect?

- line 353-364: It would be better if you can calculate time different of two vertical lines (peak concentrations) and compare with time needed for boundary layer increasing from AMX site (532 m) to TRO site (1819 m).

- line 375-377: “In contrast, the peak concentrations occurred at the same time of day for individual NPF events at each site, implying a uniform influence of local-to-regional atmospheric conditions on the particle formation process”. I don’t understand this phrase. Please clarify and correct it.

- line 404-411: This section should move to introduction section. In addition, meteorological parameters like wind and temperature affect boundary layer evolution not PBL evolution affects meteorological parameters.

- line 448: “grey-coloured thin lines” → “grey thin line”