

## ***Interactive comment on “The research on small-scale structures of ice particle density and electron density in the mesopause region” by Ruihuan Tian et al.***

### **Anonymous Referee #2**

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This paper presents a model where they investigate whether gravity, the neutral drag force, and ice particle growth by adsorption of water vapor can explain why ice particles near the polar mesopause are frequently seen to be confined into small-scale structures in summer. Much has now been understood about these ice particles, and we know how, once these small-scale structures have been created, the polar mesosphere summer radar echoes (PMSE) arise. However, we still do not have a good understanding of the formation mechanism of these small-scale structures, which this paper aims to improve. I therefore think that a paper on this topic is well worth publishing. However, I do have some minor questions regarding their model, which should be resolved before this paper is considered for publication. 1. In line 126, “Substituting

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Eq. (9) into Eq. (2)...” should be changed to “Substituting Eq. (9) into Eq. (3)...” 2. In line 133-134, there are two predicates in the sentence “It is set that  $z_0 = 0$  for the lower boundary and  $z_0 = h$  for the upper one, here  $h$  is the distance between the two boundaries.” 3. Authors should add some new references showing new progress in pmse.

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