This manuscript discovered an interesting phenomenon in wind blown sand field, which is 3D-electric field. This topic in frontier and has innovation. There are some questions according to the manuscript.

1) The electric field caused by the wind blown sand is due to the charged particles, and the 3D E-field is correlated with the particle concentration on 3 direction. It is suspicious that the magnitude of streamwise E-field is ten times larger than the vertical E-field. For the streamwise and spanwise particle concentration is much more even than the vertical E-field. Why there would be a stronger E-field in streamwise and spanwise? Does the value of wind pressure related with the measured E value? Please explain more in details about the sensor you use and the measure method.
2) The fig.4 can be more persuasive if you plot the DWT component of shaded area of E-field in all directions. And it lacks of explanation of how the shaded area is much more stable than other data.
3) the mass flux of sand particles is influenced by both the horizontal and vertical E-field, and from the measurement result we can see that the streamwise and

spanwise E-field are mostly induced by the fluctuation of wind field. Thus, the horizontal wind field seems very important in calculating the mass flux. But in the calculation, the author used a 1D wind field implemented by the 3D E-field, which I think is not precise. From the fig. 8 we can see it the mass flux is almost the same with/without the vertical E-field. What if you implement the 3D E-field into a 3D wind-field? Will it be such a big difference between the vertical E-field and 3D E-field?

4) In Figure 10, can you explain more about the results shown? Why does the mean charge to mass ratio decrease fast with a certain value of charge density? How did you calculated the mean charge to mass ratio? Does it depend on the particle size? Why there is a peak value for percent increases in saltation height when charge density is at one value? It seems like the increase rate for mass flux and saltation height will becomes a stable value with the increasing charge on particle, does it accordant with the actual situation?

5) In page 4, line 2, the author criticized the Schimidt et al.'s work as a wrong measurement. Actually, it is

reasonable that Schimdt pointed out the finding of upward pointing electric field, for the measurements results show that the large particles (near the ground) carries the positive charge, and the small ones in high air carries the negative charge.

6) In Fig 7, the results show that only in very strong wind situation, the charge separation is a little bit obvious. The author should make more explanation about this figure.

7) In figure 10, the unit of mass to charge ratio should be uC/kg, not uC/m^3.

8) Charge on particles is one of the most important parameters in the simulation of charged particle movement. In this manuscript, the author explained the model implemented but didn't compare the charge of particle with the measured value, and also the variation process of particle charge. This can be a part of the validation of calculation.

9) The dimension of equation of 26(d) is not correct, for it's not a dimension of speed in the right side.

10) In figure 9, the mass concentrations and mean particle horizontal speeds of the case without E-field (case 1) and only with vertical component (case 2) are almost the

same, but a little different from the 3-D E-field (case 3). However, in contradiction with it, figure 8 shows that the mass flux in case 1 is closer to case 3, not case 2. It doesn't make sense.