The author's responses of the review are long and in detailed. However, there are still some problems remaining:

1. According to the revised manuscript and the response of the review, the author expected the 3D electric field is produced by the very large turbulence structure, based on the idea of the volcanic eruption experiment of Cimarelli (2013). However, the size of particles in Cimarelli's experiment is binary distribution, and move in the vertical direction, while in the simulation of this paper, the size distribution of sand is continuous distribution based on field observation, and move horizontal, is the pattern of movement still the same as that of Cimarelli's experiments? In my opinion, the large particles are more likely to distribute near the ground due to gravity, and small particles disperse in the air, so that the vertical electric field should be much larger than horizontal electric field.
2. The author explained that large-scale and super large-scale turbulent structures are the reasons for formation of the horizontal electric field. While the size of large-scale or the super large-scale structures should be several ten meters or hundred meters, which is much larger than the scale of the experiment (below 1m) in the manuscript.
3. The author declared it is a 3D simulation, but the width of the domain in the manuscript is only 0.1 meters, which is much smaller than vertical scale, which should be considered as a 2D model.
4. The author indicated the mean mass-charge ratio is independent with the particle size distribution. However, the author calculated the charge based on the charge separation model, in which the amount charge transferred is calculated by the different contact surfaces. So, the mass charge ratio should be affected by the particle size distribution.
5. The number of Eq. 28 (line 18 in page 19) is wrong, which should be 29.
6. The author was wrong in response of question 10): below 0.01m, we can see from the Fig .10, mean velocity <up>, case 1<case 2 ≈ case 3, not case 3 ≤ case 2 ≤ case 1, so we cannot conclude the value of mas flux: case2< case 1<case3, it should be case 1<case 2 < case 3.
7. In section of 3.5, the author made a wrong cite, which there is no definition of mean charge to mass ratio in the papers of Carneiro et al., 2013 and Dupont et al., 2013. Actually, the unit of mean charge to mass ratio should be C/kg, while in the formula(28d), the author considered it as m*C/s, which is not suitable in basic physic meaning.
8. In the supplement file, the PSD of particles was plotted in Figure S1, in which the mean particle size is around 100um. The author chose 100uC/kg as the mean charge to mass ratio, as well as considered the mean charge of one particle with 1.64×10^{-12}, which are contradictory. The mean charge of one particle should be calculated as Q=charge mass to ratio*Mass of particle = $100uC/kg*4/3\pi*(10^{-4})^3 \approx (10)^{-16}$, which is not agree well with the value of charge to mass in the paper of Merrison (2013).

9. In page 23, the author wrote the charge density effects the magnitude of transferred charges a lot when the charge density is low, which is easily to make a misunderstand. First, the author needs to clarify the reason why different particles have different capacity on unit surface. Actually, this character ρ_0 should not be called the charge density of particles. The author used it as the maximum capacity of charge on each unit surface on particles. The charge density should be calculated by the total charge divided by the particle surface. ρ_0 should be a constant value, which should be only decide by the material of the particles. The reason why when ρ_0 is over 10^{18}, the mean charge to mass ratio getting stable is the product of $\rho_i S_i - \rho_j S_j$ is getting same value. ρ_0 is not the main decision role anymore in the calculating this formula.
10. In Figure 5, the author showed the details about the electric field value varies with time. There is an interesting phenomenon that the magnitude of spanwise electric field and streamwise electric field are almost the same, and the vertical electric field oppositely varies in trend comparing to them. The author didn't explain the reason of this phenomenon. If the author considers the spanwise and horizontal electric field are caused by the structure of turbulence, why does the magnitude and variation of spanwise electric field and streamwise electric field are almost the same? In fact, the turbulence structures in spanwise and streamwise should be different.
11. In the manuscript, the results show that the horizontal electric field is much stronger than the vertical electric field, which indicate particles will have strong spanwise motions, which seem not consistent with the real situation. The author could compare the magnitudes of the horizontal electric force and drag force.