China is one of the largest agricultural countries in the world. The NH3 emissions from agricultural activities in China, such as fertilizer and husbandry, farmland ecosystems, livestock waste, crop residue burning and fuel wood combustion, significantly affect regional air quality and horizontal visibility by contribution to secondary inorganic aerosols. In the manuscript, the air quality modeling system RAMS-CMAQ (regional atmospheric modeling system-community multiscale air quality), coupled with the ISAM (integrated source apportionment method) module is applied to capture the contribution of NH3 emitted from total agriculture (Tagr) in China. It explores that the annual average contribution of Tagr NH3 to PM2.5 mass burden in China was 14-18%. Specific to the PM2.5 components, Tagr NH3 provided a major contribution to ammonium
formation (87.6%) but a tiny contribution to sulfate (2.2%). Though the Tagr NH3 only contributed 10.1% of nitrate under current emissions scenarios, the reduction of nitrate could reach 98.8% upon removal of the Tagr NH3 emissions. The results are meaningful, but the explanation for these phenomenon was not enough. I recommend the manuscript to be accepted after some minor revisions, and detail some issues below.

Major points: 1. The most important gas in this manuscript was NH3, but there are no NH3 in Figure 2 in comparing between the modeled and observed results. 2. Why is the NH3 contribution to nitrate small under "rich NH3" conditions and large in "poor NH3" environments? What is the internal logical relationship? 3. The study period is January, April, July, and October, but only the modeled and observed results in January and July are compared in Figure A1, A2, A3 and A4. 4. The author thinks that the obvious deviation between the observed and modeled SO2 in January may be a systemic underestimation due to the lack of emission intensity in this month. Did the lack of emission intensity only appear in SO2? Why are SO2 and NO2 underestimated and PM2.5 overestimated? 5. How much NH3 is removed in Figure 7? And it's more intuitive to use a negative value for reduction. 6. Why do the trend of the decrease in ammonium mass concentration accelerate while NH3 emissions is less than 20%? 7. What is the horizontal distributions of the contribution percentage of NH3 emissions to ammonium, nitrate and sulfate mass concentration, respectively? Which aerosol determines the horizontal distributions of SNA mass concentration? Why is the horizontal distributions of NH3 emissions different with the horizontal distributions of the contribution percentage of NH3 emissions to SNA mass concentration?

Minor points: 1. In Figure 6 and Figure 7, it should be the horizontal distributions in January, April, July, and October. 2. In Line 226, it should be “Since NH3 concerns mainly with secondary inorganic aerosols (SNA): sulfate, nitrate, and ammonium formation”. 3. In line 269, what is “TA NH3 emission”? 4. In Line 833, should is it “The regional percent (%) of Tagr NH3 contribution”?