

Interactive comment on “Atmospheric dry and wet nitrogen deposition in agro-pastoral catchments of the China and Mongolia Altay” by Jin Ling Lv et al.

Anonymous Referee #1

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The manuscript (BG-2017-55) reported field measurement of atmospheric nitrogen dry and wet deposition in different land uses in China and Mongolia. The chosen topic is interesting but the manuscript is not well written and there are some concerns about the methodology and discussions.

Some scientific issues. (1) The experiment was conducted only for one year, which is not enough for a field observation of nitrogen deposition. Nitrogen deposition is influenced by emission, weather conditions, which have high variation among years. The manuscript try to estimate annual N deposition in several land uses by one year observation, the results are not representative. (2) The study measured gases and particulate N concentration and use dry deposition velocity V_d to calculate nitrogen

C1

dry deposition. But authors choose V_d values from a reference (Flechard et al, 2011). And from Table 3, authors use same V_d of NH_3 and NO_2 for all three canopy and two countries. This methodology is not valid. V_d is affected by weather conditions and canopy types. It is changed diurnal, seasonal, and yearly for different plant types in different places. Therefore, it is not proper to European V_d data to represent V_d in China and Mongolia. Since weather data are available for authors from meteorological stations, V_d (hourly, daily or monthly) for different canopy of different N_r could be calculated easily. There are many widely used methods for this calculation, such as using big-leaf model. (3) This study used the self-made wet collection equipment as shown in Fig. 3. However, the equipment is not well designed. The top of the equipment is open without a lid, which may also collect some dry deposition especially particulate N deposition, therefore, the collected deposition by this kind of equipment is usually considered as a mixture of wet deposition and part of particulate dry deposition. By using this equipment, the wet deposition is therefore overestimated. Authors did not include any correction for this either, which resulted in high uncertainty of the reported N deposition amount. (4) The discussion needs improve. All discussion section just repeat some results and simply compared with several other studies but no detailed and deep discussion was presented. The difference of total N deposition amount and contribution of different N_r forms for different land uses could be due to the difference of fertilizer input, management, emission, and deposition process. And the difference between two countries might reflect the difference of management tradition and urban development. The discussion about N_r deposition and their potential sources among different land uses and between China and Mongolia are much more important and interesting than the comparison of the annual values with other studies since one year observation result in the manuscript is not enough to represent annual N deposition. (5) The section 4.3 try to discuss the uncertainty of N deposition, but authors just discussed about NH_3 compensation point. It will be better if authors could add an uncertainty analysis about N deposition, which could partly compensate the shortage of one year observation.

C2

There are many format and punctuation problems in the manuscript. I suggested authors to do some technical corrections about spelling and format at the Initial Manuscript Evaluation report, but unfortunately, these errors were not corrected for the discussion paper. (1) Punctuation problems. Space is needed after each word! For instance, page 1, line 19, add a space before “at six sampling. . .”; page 1, line 24, add spaces before “in China” and before “ in Mongolia”. There are lots of this problem in the manuscript. Please carefully check the whole manuscript and corrected these problems! (2) Table 3, reference Shen et al. (2011) was not found in References. Please check citation and reference list. (3) Fig.1, please add Nansha Islands for China map. (4) Fig. 6, figure caption should start from the next line. (5) Fig. 7 and Fig. 8, figure captions are not consistent with figures. (6) Fig. 9, remove “liner fit of B” in figure.

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