Dear editor or reviewer:

Many thanks for giving us the constructive comments on our manuscript. We have revised our manuscript carefully according to your suggestions. The followings are the responses to your comments.

Comment 1: This MS has a significant flaw in experimental design, which involved single plot for each treatment and used pseudo-replicates for comparison between the treatments and EF calculation.

Nevertheless, the data of four successive years in each plot are valuable in terms of showing the interannual variation of the seasonal and annual emissions. The authors may focus on the temporal variation of the fluxes, and causes of temporal variation for each fertilization practice, instead of comparing the emissions from the two plots with different fertilization treatments. EF should not be calculated in the MS, due to the pseudo-replication problem. The EF numbers presented in this paper are not reliable at all. Thus the authors should not present or discuss EF in the paper. I suggest the authors rewrite the MS for publication in any journal.

My specific comments, suggestions and questions are marked in the MS (see the supplement), of which may authors ignore my remarks for any statement on "EF" as such statements will be deleted in rewriting.

Response: Sorry, we don’t agree with you about the significant flaw of our experimental design. To our knowledge, there is no standard method of experimental design for measuring N_2O emissions from agricultural field. We admit that large spatial variation of N_2O emissions from agricultural field exists due to uneven distribution of soil character or fertilization. The data of N_2O emissions from the two plots designed by this study were statistically analyzed before fertilization and after 10 days of fertilization, and no significant difference (T-test, $P>0.05$) was found, indicating that the influence of uneven distribution of soil character on N_2O emission from the investigating agricultural field might be less important. As for the fertilization plot, large difference (>50%) of N_2O emission among the three replicates was occasionally observed, implying uneven distribution of fertilization was the key reason for the large spatial variation of N_2O emissions from agricultural field. Even if three plots were adopted for one treatment, the reviewer's opinion, it is still difficult to avoid the uneven distribution of fertilization. Therefore, our experimental design using single plot for each treatment is reasonable for the statistical analysis and EF calculation.

We are very grateful to your careful remarks which will be great help for improving our manuscript.

Comment 2: Line 14-17, p18338: It is not reasonable to estimate the emission of the NCP region using measurements at a single site.

Response: According to your suggestion, the estimation was deleted in our revised manuscript.

Comment 3: Direct emission factor (EF_d) is consistent with the IPCC concept, and thus is suggested use in this study. (P18339)

Response: According to your suggestion, "fertilizer-induced emission factor (EF)" was replaced by "direct emission factor (EF_d)" in the revised manuscript.

Comment 4: Line 29, p18339: incomplete review of the previous reports!!.

Response: The missing references of "Ding et al., 2013; Hu et al., 2013; Shi et al., 2013; Yan et al., 2013" were added in our revised manuscript (Line 29, p18339).

Comment 5: Line 4, p18340: skip off 1.4% from the list in table 4.

Response: We skipped off 1.4% from the list in the Table 4.

Comment 6: Line 19, p18340: How many replicates for each treatment?

Response: As mentioned in our manuscript (Line 4, p18341), there were three replicates for each treatment.

Comment 7: Line 1, p18341: You have to present very detailed description of the methods and procedures applied, so that readers are able to judge the reliability of N_2O fluxes.

Response: According to your suggestion, we present the experimental details in Section 2.2 (Line 9 and Line 12, P18341) in our revised manuscript as following:

Line 9: Four gas samples were taken from the headspace by a sampling mini-pump (NMP 830 KNDC, Germany) to aluminum combined polyester gas sampling bags (200 mL, Delin, Dalian, China) at 10-min intervals after the chambers were deployed. The first sample was taken after 2 min of covering chambers.

Line 12: An improved GC-ECD method was applied to measure N_2O concentration in this study (Zhang et al., 2013). High purity of N_2 (99.999%) was used as carrier gas and a makeup gas (979 ppmv CO_2 in N_2) was introduced into the downstream of the analytical column. The variation coefficient of our method for analyzing N_2O was less than 0.31%. The negligible influence of CO_2 on N_2O measurement and the good linear correlation between the GC-ECD responses and N_2O concentrations were found by our improved GC-ECD method (Zhang et al., 2013).

Comment 8: Line 5, p18341: How did you deal with the maize plants when they were higher than the chamber?

Response: The top part of the maize plant above the chamber was cut off when its height exceeded 80 cm (after ~40 days growing). We added the description in Section 2.2 (Line 6, P18341).

Comment 9: Line 7-8, p18341: This is true for the 2010-2011 rotation, but not for the others! How did you fill the big gaps and dealt with the uncertainty when you estimate annual/seasonal emissions and emission factors?

Response: In comparison with 2010-2011, the sampling frequencies in 2008-2010 maize-wheat rotations were relatively low. To accurately measure N_2O emissions, the sampling frequency is increased to once or twice weekly during the periods of no fertilizer application in 2010-2011. We present detail information about the sampling frequency as following (Line 6-8, p18341): N_2O flux was measured every day within duration of more than 10 days after fertilization (except the period of basal fertilizer application in 2008 maize season), then continuous sampling for 5-11 days monthly (2008-2010 maize-wheat rotations) or once to twice weekly (2010-2012 maize-wheat rotations) during other periods of crops' growing seasons excluding the winters (from December to February) in 2008-2010 maize-wheat rotations.

As mentioned in our manuscript (line 14, p18342), the cumulative N_2O emission from each treatment was estimated by linear interpolation between the sampling days. The uncertainty of annual emissions was estimated by the three replicates in each treatment and expressed as standard error (SE) in the manuscript. The standard error of the direct emission factor was estimated using the standard errors for the cumulative emissions from the fertilized and the unfertilized plots (Cui et al., 2012, Soil Biology & Biochemistry).

Comment 10: Line 8, p18341: How many gas samples were taken to determine each flux? What time interval?

Response: The detail information of sample numbers and the time interval are answered in **Comment 7**.

Comment 11: Line 17, p18341: Four concentrations and the linear model are questionable to some extent for determine a flux. How could you deal with the nonlinear cases? (See Wang et al., 2013, Agr. Forest Meteorology)

Response: Most of commercial instruments of GC-ECD using high purity N_2 or Ar-CH_4 as carrier gases have been found to be non-linear respond to N_2O concentrations (Hall et al., 2007, Journal of Geophysical Research; Zheng et al., 2008, Plant and Soil; Fang et al., 2010, Acta Scientiae Circumstantiae; Wang et al., 2010, Adv. Atmospheric Sci.), and hence the linear regression with four samples for determining N_2O fluxes would result in bias. However, the very good linear correlation (R^2=0.9996) between N_2O concentrations (0.093-1.97 ppm) and the responses of the GC-ECD was found for the improved GC-ECD by introducing CO_2 as makeup gas in this study, which could insure that the N_2O fluxes measured were reliable. Furthermore, more than 98% of the N_2O fluxes were obtained with linear correlation coefficient (R^2) greater than 0.95, and only a few small fluxes close to the flux detection limit were measured with $0.85<R^2<0.95$. The reliable GC-ECD method for N_2O measurements may be an important reason for the larger EF_d measured by this study than previous studies in the NCP.

Comment 12: Line 6, p18342: This test does not apply here!

Response: We have deleted the test in the revised manuscript.

Comment 13: Line 7-9, p18342: The T-test does not apply for your case!

Response: T-test was widely used to compare the differences between different treatments. We think it is reasonable to apply T-test to analyze the differences between CK and NP treatments during the periods of no fertilization. We don't understand your opinion about the application of T-test.

Comment 14: Line 19, p18343: Your description of methods provides little information for readers to judge how reliable these negative fluxes are. You need to convince readers with more detailed supporting materials, e.g. checking the stability of N_2O during storage and transportation with gas bags, measuring the flux detection limit (at 95% confidence interval) by injecting gases with known concentrations into gas bags and analyzing later, or using more strict criteria to accept a negative flux. I don't think the negative fluxes are believable, unless you are able to confirm them. They are likely caused by improper operation or instable instrument signal during sampling, sample transportation and analysis in lab.

Response: We have added the details of the method in our revised manuscript as the response in **Comment 7**. In addition, we have checked the stability of N_2O in gas bags during storage and transportation, and the variation coefficients were less than 1% within 10 days. We checked the original data of negative fluxes, and the determination coefficients (R^2) of the linear regression between N_2O concentrations and times were usually larger than 0.90. The flux detection limit was 1.6 ng N m^{-2} s^{-1} in this study. Therefore, the negative fluxes close to the flux detection limit could be ascribed to the instable instrument signal, while the large uptake (-37 ng N m^{-2} s^{-1} in the CK and -19 ng N m^{-2} s^{-1} in the NP plots) might be due to the denitrification and nitrifier denitrification (Chapuis-lardy et al., 2007). Many researches also reported evident negative N_2O fluxes from agriculture fields (e.g. Yamulki et al., 1995; Mahmood et al., 1998; Cui et al., 2012; Yan et al., 2013).

We also revised the Section 3.2 (from line 16 to line 22, p18343) as following:
The N_2O concentrations were usually measured within 10 days, and the variation coefficient of N_2O concentrations in gas bags during storage and transportation was less than 1%. Considering the flux detection limit was 1.6 ng N m^{-2} s^{-1} in this study, the negative fluxes close to the flux detection limit could be ascribed to the instable instrument signal, while the large uptakes (-37 ng N m^{-2} s^{-1} in the CK and -19 ng N m^{-2} s^{-1} in the NP treatments) might be due to the denitrification and nitrifier denitrification (Chapuis-Lardy et al., 2007). Many researches also reported evident negative N_2O fluxes from agriculture fields (e.g. Yamulki et al., 1995; Mahmood et al., 1998; Cui et al., 2012; Yan et al., 2013).

Comment 15: Line 28, p18344: What dose “total N_2O emission” mean? Do you mean the total variance in N_2O fluxes?

Response: Sorry, “total N_2O emission” should be “N_2O emission”, and we have revised it in the manuscript.

Comment 16: Line 12, p18345: Error for each? You are able to calculate the error at the 95% confidential interval since you know the errors of the emission fluxes involved in the EF_d calculation.

Response: We calculated the error of EF_d based on the standard errors for the cumulative emissions from the fertilized and the unfertilized plots (Cui et al., 2012, Soil Biology & Biochemistry).

Comment 17: Line 22-25, p18345: I don't think the fitting with R^2=0.754 for n=4 is significant at P<0.05! Case of "n=4" requires R^2=0.90 to meet P=0.05! Delete this part as the fitting is not significant!

Response: The equation was fitted by Origin 8.0 with the R^2=0.75, P<0.05 for n=4. We don't understand your opinion about this fitting.

Comment 18: Line 9, p18346: Why are the parameters given so precisely? The decimals should be determined by your measurement precision of N_2O emission!

Response: According to your valuable suggestion, we keep the two significant figures based on the measurement precision of N_2O emission.

Comment 19: Line 19, p18346: excluding the 10-day periods following each fertilization events. You can not use T-test in your case.

Response: According to your suggestion, the sentence of "There were no significant differences between the CK and NP treatments during the no fertilization periods in the four years" is revised to "There was no significant difference between the CK and NP treatments during the periods of four years excluding the 10-day durations following each fertilization event" The comment about T-test has been replied in **Comment 13**.

Comment 20: Line 21-25, p18346: Directly present this fitting if P<0.05 (N=4, R^2=?, P<?), and rewrite the part in "[ ]".

Response: As mentioned in our manuscript (line 2-3, page 18346), for the NP plot, there was no evident correlation between the annual cumulative N_2O emissions and rainfall intensity. Significant linear correlations were only observed between the fertilizer-induced N_2O emissions (*F*, kg N ha^{-1}) during the periods of 10 days after fertilization and the amounts of rainfall (*X*, mm) from 4 days before to 10 days after fertilization in the maize, wheat seasons and whole year. In the maize season, the correlation could be expressed as $F_{maize}=0.035X_{maize}-0.48$ (n=4, R^2=0.93, P<0.05); in the wheat season, the equation was F_{wheat}=0.077X_{wheat}-0.11 (n=4, R^2=0.94, P<0.05); in the whole year, the equation could be expressed as F_2=0.048X_2-1.06 (n=4, R^2=0.99, P<0.05). Therefore, the annual cumulative N_2O emissions (F_{annual}, kg N ha^{-1}) contained two parts: background N_2O emission (F_1) and fertilizer-induced N_2O emission (F_2), which was similar with the result of Lu et al. (2006).

We revised the statement (line 2-9, page 18346) as following: As for the NP treatment, there was no evident correlation between the annual cumulative N_2O emissions and rainfall intensity. Significant linear correlations were only observed between the fertilizer-induced N_2O emissions (F, kg N ha^{-1}) during the periods of 10 days after fertilization and the amounts of rainfall (X, mm) from 4 days before to 10 days after fertilization in the maize, wheat seasons and whole year. The equations could be orderly expressed as:

F_{maize}=0.035X_{maize}-0.48, N=4, R^2=0.93, P<0.05; (3)

F_{wheat}=0.077X_{wheat}-0.11, N=4, R^2=0.94, P<0.05; (4)

F_{year} =0.048X_2-1.1, N=4, R^2=0.99, P<0.05. (5)

In addition, we rewritten the part in "[ ]" (line 21-23, p18346) as following: Therefore, only based on rainfall, the annual cumulative N_2O emissions (F_{annual}, kg N ha^{-1}) from the agriculture field could be obtained by integrating the equation (2) and (5) as following:

$$F_{annual}=5.6\times10^{-10}X_1^{3.7}+0.048X_2-1.1. \quad (6)$$

Comment 21: Line 7, p18347: annual rate or rate of individual fertilization events?

Response: F is the annual application rate of N-fertilizer.

Comment 22: Lu et al. (2006, Chemosphere, 65: 1915-1924) report a function to link N_2O emission, precipitation and N-fertilizer input. What are your comments about that as compared with yours? (p18347)

Response: We compare our result with the study of Lu et al. (2006). The empirical equation in this study was similar with that established by Lu et al. (2006), who investigated the N_2O emissions from upland soil between 1982 and 2003 in the literatures, and also deduced a model including background and fertilizer-induced N_2O emissions based on annual precipitation and fertilizer N input. Nevertheless, unlike our result, Lu et al. (2006) reported a linear regression expression between participation and background N_2O emission.

Comment 23: Line 14-24, p18347: You review here involves incomplete reports for the NCP study on N_2O emission. You'd better collect all available literatures for the review and discussion!

Response: We collected all available reports for the NCP studies on N_2O emission and listed them in Table 4. In addition, according to the comment of Referee $1^{\#}$, we have revised the Section 4.2 (Line 14-24, P18347) as followings:

The results of studies about maize-wheat rotation field in the NCP are shown in Table 4. It is evident that there are very large temporal-spatial variations of the cumulative N_2O emissions and EF_d reported in the NCP. With only the exception of the data in 2009–2011 maize-wheat seasons, the cumulative N_2O emissions from the NP treatment in this study were 33–108 % greater than the upper limit value reported in the literatures. The EF_d value of 0.60 % in 2009–2010 was in good agreement with the values reported by Dong et al. (2000), Ding et al. (2007), Cui et al. (2012), Cai et al. (2013) and Yan et al. (2013), and of 1.1 % in 2010–2011 was in line with the values reported by Li et al. (2010), Wang et al. (2008), Cai et al. (2013) and Yan et al. (2013). The EF_ds from the NP treatment in 2008–2009 and 2011–2012 were two times greater than the upper limit value reported in the NCP, but were still within the uncertainty range recommended by the IPCC (0.3–3 %, De Klein et al., 2006). In comparison with 2009-2010 and 2010-2011, as shown in Fig. 1 and Fig. 2, the higher N_2O emissions in 2008-2009 and 2011-2012 were mainly ascribed to the rain events with relative high frequency or great intensity just around fertilization events. In addition, the relatively high sampling frequency conducted in this study may be partially responsible for the higher EF_ds. Smith and Dobbie (2001) investigated the impact of sampling frequency on cumulative N_2O fluxes by manual chambers with sampling intervals of 3-7 days and auto-chambers with sampling intervals of 8 hours, and found that the short-lived N_2O peaks after fertilization can not be detected by manual sampling under low sampling frequency. The sampling frequency in this study was everyday with duration at least 10 days after each fertilization event, whereas the sampling frequencies for most previous studies in the NCP were 1-2 times weekly. On the other hand, the very good linear (R^2=0.9996) response to N_2O concentration (0.093-1.97 ppm) of the GC-ECD improved by our group could make sure the accurate quantification of N_2O in the air samples with remarkably different N_2O concentrations. Most of commercial instruments of GC-ECD have been found to be non-linear response to N_2O concentrations (Hall et al., 2007; Zheng et al., 2008; Fang et al., 2010; Wang et al., 2010), and thus the single point calibration for N_2O flux measurements prevailing used by previous studies would result in relatively low EF_ds.

Comment 24: Line 18, p18348: 1. How much are the uncertainties of these estimates at 95% confidential interval? 2. Why didn't you make the estimates based on your data as well as the data from literatures?

Response: According to your previous suggestion, we have deleted the information about the estimation of NCP in our revised manuscript (Line 14-18, p18348).

Comment 25: P 18354: Unites of N_2O flux and the influencing factors? What dose "B" mean? Are "R^2" and "R" marked in the Table 2 same? What depth of the soil temperature?

Response: Unites of N_2O flux, soil temperature and mineral N (NO_3^--N and NH_4^+-N) were ng N m^{-2} s^{-1}, ^{0}C and mg kg^{-1} dry soil, respectively. "B" means the regression coefficient of each influencing factor in the equation. R^2 is the determination coefficient of each variable, and R is the correlation coefficient of the regression equation. The soil temperature at a depth of 10 cm was measured.

Comment 26: P18356: Skip off this EF value as it is not comparable at all with the others.

Response: We skipped of the EF of 1.4% in our revised manuscript.

Here are the corrections in our revised manuscript:

Page 18338 line 3: “N_2O” is replaced by “nitrous oxide (N_2O)”, and “rotation” is inserted;

Page 18338 line 4: “the” is inserted;

Page 18338 line 5: “the” is inserted;

Page 18338 line 8: “Fertilizer-induced” is replaced by “Annual direct”;

Page 18338 line 9: “EFs” is replaced by “EF_ds”; “2.4”, “0.60”, “1.1” and “2.9%” are revised to “2.4±0.5%”, “0.60±0.01%”, “1.1±0.09%” and “2.9±0.18%”, respectively;

Page 18338 line 10: “mean annual” is inserted;

Page 18338 line 11: “from” is inserted; “and” is replaced by “to”;

Page 18338 line 12: “0.04767”, “1.06453”, “0.99241” and “P=0.00253” are replaced by “0.048”, “1.1”, “0.99” and “P<0.01”, respectively;

Page 18338 line 13: “EFs” is replaced by “EF_ds”; “from the agricultural field” is deleted;

Page 18338 line 14: “intensity” is inserted;

Page 18339 line 3: “N” is revised to “nitrogen (N)”;

Page 18339 line 15: “direct” is inserted; “EFs” is replaced by “EF_ds”;

Page 18339 line 17: “uncertainty” is replaced by “uncertainties”;

Page 18339 line29: “the ten” is replaced by “those”;

Page 18340 lines 1-3: “nine studies conducted one year, and only the study of Cai et al. (2013) implemented the N_2O measurement for three years (2004–2007).” is revised to “many studies conducted one year, and only the studies of Cai et al. (2013), Hu et al. (2013) and Yan et al. (2013) implemented the N_2O measurement more than one year.”

Page 18340 line 4: “EFs” is replaced by “EF_ds”; “0.10-1.4%” is replaced by “0.10%-1.0%”;

Page 18340 line 6: “a” is inserted;

Page 18340 line 8: “characters” is deleted; “,” is replaced by “;” “and” is inserted;

Page 18340 line 9: “.” is inserted;

Page 18340 line 10: “and (3) to assess the total N_2O emission from the maize wheat field in the NCP.” is deleted;

Page 18340 lines 17-18: “plot” is deleted;

Page 18341 line 9: “around” is inserted;

Page 18341 lines 23-24: change “(NH_4^+-N and NO_3^--N concentrations)” to “(NH_4^+-N and NO_3^--N) concentrations”;

Page 18342 line 1: “the” is inserted; “plot” is replaced by “treatment”;

Page 18342 lines 5-7: “normal distributions” is replaced by “data”; “were tested using the Shapiro–Wilk test and data” is deleted;

Page 18342 lines 8-9: “the no fertilization periods” is replaced by “the periods of four years excluding the 10-day durations following each fertilization event”;

Page 18342 line 15: change “interpolations” to “interpolation”; “EFs” is replaced by “EF_ds”;

Page 18342 line 24: “seasons” is replaced by “rotations”;

Page 18343 lines 16-22: “season” is replaced by “rotation”;

Page 18344 lines 26-27: change “Evidently, soil mineral N, temperature and WFPS were positively correlated with N_2O emission.” to “Evidently, N_2O emission positively correlated with soil mineral N, temperature and WFPS.”;

Page 18344 line 28: “total” is deleted; “influence” is deleted;

Page 18344 line 29: “the” is deleted and “relationships with” is replaced by “influences on”;

Page 18345 line 4: “EFs” is replaced by “EF_ds”;

Page 18345 line 5: “plot” is replaced by “treatment”; “4 yr” is replaced by “4-year”;

Page 18345 line 7: “plot” is replaced by “treatment”; “the” is inserted;

Page 18345 line 8: “the” is inserted;

Page 18345 line 9: “seasons” is replaced by “rotations”;

Page 18345 line 11: “%” is inserted;

Page 18345 line 12: “EFs” is replaced by “EF_ds”; “2.4%, 0.6%, 1.1% and 2.9%” is revised to “2.4±0.5%, 0.6±0.01%, 1.1±0.09% and 2.9±0.18%”;

Page 18345 line 13: “seasons” is replaced by “rotations”; “4 yr” is replaced by “4-year”; “EF” is replaced by “EF_d”;

Page 18345 line 22: change “plot” to “treatment”; “intensity” is inserted;

Page 18345 line 24: “R^2 = 0.754, *P* = 0.013” is revised to “R^2=0.75, *P*<0.05”;

Page 18346 line 15: “yearly” is deleted;

Page 18346 line 17: “in each year” is deleted;

Page 18346 line 18: “were” is revised to “was”; “differences” is modified to “difference”;

Page 18346 line 19: “no fertilization” is deleted; “in the” is replaced by “of”; “excluding the 10-day periods following each fertilization event” is inserted; “*P* = 0.056–0.177” is replaced by “*P* >0.05”;

Page 18346 line 27: “rate is” is modified to “rate and irrigation practice are”;

Page 18347 line 5: “-” is replaced to “+”;

Page 18347 line 6: “empirical” is inserted; “derived from the correlation of” is revised to “estimated with”;

Page 18347 line 7: “annual” is inserted;

Page 18347 line 9: “widely” is inserted; “global” is replaced by “regional, or even global,”;

Page 18348 line 5: “EFs” is replaced by “EF_ds”;

Page 18348 lines 14-18: this paragraph is deleted.

Page 18348 line 22: “temporal-spatial” is replaced by “interannual”;

Page 18348 line 23: “be used to” is changed to “provide an approach to”;

Page 18348 line 24: “rate” is revised to “rates”;

Page 18350 line 4: “Ding, W., Luo, J., Li, J., Yu, H., Fan, J. and Liu, D.: Effect of long-term compost and inorganic fertilizer application on background N_2O and fertilizer-induced N_2O emissions from an intensively cultivated soil, Sci. Total Environ., 465, 115–124, doi:10.1016/j.scitotenv.2012.11.020, 2013.” is inserted;

Page 18350 line 13: “Fang, S. X., Zhou, L. X., Zhang, F., Yao, B., Zhang, X. C., Zang, K. P., Xu, L., Liu, L. X., Wen, M., and Gu, S.: Dual channel GC system for measuring background atmospheric CH_4, CO, N_2O and SF_6, Acta Scientiae Circumstantiae, 30, 52-59, 2010 (in Chinese).” is inserted;

Page 18350 line 16: “Hall, B. D., Dutton, G. S., and Elkins, J. W.: The NOAA nitrous oxide standard scale for atmospheric observations, J. Geophys. Res., 112 (D09305), doi: 200710.1029/2006JD007954, 2007.”is inserted;

Page 18350 line 25: “Hu, X. K., Su, F., Ju, X. T., Gao, B., Oenema, O., Christie, P., Huang, B. X., Jiang, R. F. and Zhang, F. S.: Greenhouse gas emissions from a wheat–maize double cropping system with different nitrogen fertilization regimes, Environ. Pollut., 176, 198–207, doi:10.1016/j.envpol.2013.01.040, 2013.” is inserted;

Page 18351 line 7: “Lu, Y., Huang, Y., Zou, J. and Zheng, X.: An inventory of N_2O emissions from agriculture in China using precipitation-rectified emission factor and background emission, Chemosphere, 65(11), 1915–1924, doi:10.1016/j.chemosphere.2006.07.035, 2006.” is inserted;

Page 18351 line 29: “Shi, Y., Wu, W., Meng, F., Zhang, Z., Zheng, L. and Wang, D.: Integrated management practices significantly affect N2O emissions and wheat–maize production at field scale in the North China Plain, Nutr. Cycl. Agroecosystems, 95(2), 203–218, doi:10.1007/s10705-013-9558-9, 2013.” is inserted;

Page 18352 line 4: “Smith, K. A., and Dobbie, K. E.: The impact of sampling frequency and sampling times on chamber-based measurements of N_2O emissions from fertilized soils, Global Change Biol., 7, 933–945, doi: 10.1046/j.1354-1013.2001.00450.x, 2001.” is inserted;

Page 18352 line 13: “Wang, Y., Wang, Y. and Ling, H.: A new carrier gas type for accurate measurement of N_2O by GC-ECD, Adv. Atmospheric Sci., 27(6), 1322–1330, doi:10.1007/s00376-010-9212-2, 2010.” is inserted;

Page 18352 line 20: “Yan, G., Zheng, X., Cui, F., Yao, Z., Zhou, Z., Deng, J. and Xu, Y.: Two-year simultaneous records of N_2O and NO fluxes from a farmed cropland in the northern China plain with a reduced nitrogen addition rate by one-third, Agric. Ecosyst. Environ., 178, 39–50, doi:10.1016/j.agee.2013.06.016, 2013.” is inserted;

Page 18352 line 31: “Zhang, Y. Y., Mu, Y. J., Fang, S. X., and Liu, J. F.: An improved GC-ECD method for measuring atmospheric N_2O, J. Environ. Sci., 25(3), 547–553, doi: 10.1016/S1001-0742(12)60090-4, 2013." and "Zheng, X., Mei, B., Wang, Y., Xie, B., Wang, Y., Dong, H., Xu, H., Chen, G., Cai, Z., Yue, J., Gu, J., Su, F., Zou, J. and Zhu, J.: Quantification of N_2O fluxes from soil–plant systems may be biased by the applied gas chromatograph methodology, Plant Soil, 311(1), 211–234, doi:10.1007/s11104-008-9673-6, 2008." are inserted.

Page 18353 Table 1: the marks "[a]", "[b]", "[c]", "[d]" are deleted; "[a] Basal fertilizer; [b] Supplemental fertilizer; [c] Total fertilization rate; [d] Compound fertilizers contained nitrogen (N), phosphorus (P), potassium (K) and sulfur (S)" is revised to "B–Basal fertilizer; S–Supplemental fertilizer; T–Total fertilization rate; NPK, NK, NS–Compound fertilizers contained nitrogen (N), phosphorus (P), potassium (K) and sulfur (S).";

Page 18354 Table 2: "(ng N m^{-2} s^{-1})" is inserted; "control" is replaced by "regulating"; "R = 0.817", "R = 0.684, P = 0.005", "R = 0.612, P = 0.016" and "R = 0.475, P = 0.011" are modified to "R = 0.82", "R = 0.68, P<0.01", "R = 0.61, P<0.05" and "R = 0.48, P<0.05",respectively; "0.334", "0.599", "0.767", "0.935", "0.488", "1.412" and "0.871" are replaced by "0.33", "0.60", "0.77", "0.94", "0.49", "1.4" and "0.87", respectively; the data in the column of "R^2" are revised to keep two significant figures; the marks "[a]" and "[b]" are deleted; "[a] Unstandardized coefficient; [b] Soil temperature" is revised to "B–regression coefficient; ST–Soil temperature (℃) at a depth of 10 cm; Unite of mineral N (NO_3^--N and NH_4^+-N)–mg kg^{-1} dry soil";

Page 18355 Table 3: "N_2O" is changed to "Cumulative nitrous oxide (N_2O)"; "EFs" is revised to "direct emission factors (EF_ds, mean±SE)"; "in different years" is replaced by "of the investigated rotations";

"Year" is deleted; "N_2O cumulative fluxes" is revised "Fluxes"; "EF" is modified to "EF_d";

"maize-wheat season" is replaced by "rotation"; the data in the column of EF_d are revised to "3.8±0.7", "0.80±0.3", "2.4±0.5", "1.1±0.02", "0.12±0.02", "0.60±0.01", "1.5±0.06", "0.73±0.06", "1.1±0.09", "2.4±0.24", "3.3±0.30", "2.9±0.18", respectively.

Page 18357 Table 4: Table 4 is attached as a supplement.

Page 18357 Figure 1: "seasons" is replaced by "rotations".

Page 18358 Figure 2: "N_2O emissions from the CK and NP plots during the N_2O measurement periods in 2008–2009 maize-wheat season **(a)**, 2009–2010 maize-wheat season **(b)**, 2010–2011 maize-wheat season **(c)** and 2011–2012 maize-wheat season **(d)**. Arrows show fertilizer applications." is changed to "N_2O emissions from the CK and NP treatments during the N_2O measurement periods in the 2008–2009 **(a)**, 2009–2010 **(b)**, 2010–2011 **(c)** and 2011–2012 **(d)** maize-wheat rotations. Arrows show fertilizer applications."