Response to reviewer 3

Many thanks for your valuable comments and suggestions, which have led to significant improvement of this paper (expressed in **Acknowledgements**). We took it seriously, and we have carefully revised the paper over the past two weeks. In the following, we would detail the changes we have made on the paper.

Quality of English Language

1. Comments: *Minor editing of English language required*

Answers: Many thanks for your suggestion. We have revised the paper carefully. Furthermore, language of the paper has been edited and verified by a professional paper editing company and the certificate is presented on the last page of this document.

GENERAL COMMENT

2. Comments: *This study is significant for enhancing the prediction efficiency of Cu content in soil. However, further improvement is necessary based on the following comments. I suggest a major revision.*

Answers: Many thanks for your recommendation and comments.

Specific comments

3. Comments: *Line 107. Please add reference of international soil classification system.*

Answers: Many thanks for your suggestion. We have added reference of international soil classification system as follows (L107-110):

"As classified by the Genetic Soil Classification of China (GSCC), the main soil types in this area are Latosolic red soils, Red soils, Yellow soils, Paddy soils, Coastal solonchaks [35,36]. According to the World Reference Base for Soil Resource (WRB), the main soil types are Acrisols, Cambisols, Anthrosols and Solonchaks."

4. Comments: *In M&M, authors need to explain how each part of spectra was treated using preprocessing treatment? I suggest to add summary table of each pretreatment parameters.*

Answers: Many thanks for your suggestion. These six traditional spectral pretreatments were carried out using the PLS_toolbox (Ei-genvector Research, Inc.) in the Matlab environment (The MathWorks, Inc.). For MC, FD, log(1/R), MSC and MSC, there may not be any parameters. But for SG, the size of the window (filter width) is 15 nm and the order of the polynomials is 3. We have added more information about the spectral pretreatment as follows (L147-148):

"(2) SG smoothing a technique that uses a low-pass filter to smooth spectra by getting rid of high-frequency noise and allowing low-frequency signals to pass through[41]. In this study, the size of the window (filter width) is 15 nm and the order of the polynomials is 3."

(L153-154):

"These six traditional spectral pretreatments were carried out using the PLS_toolbox (Ei-genvector Research, Inc.) in the Matlab environment (The MathWorks, Inc.)."

5. Comments: *Line 176: Explain the parameters of models. i.e., numbers of PC.*
Answers: Many thanks for your suggestion. We have explained the parameters of PLSR models as follows (L200-202):
"The calibration set was employed to build the PLSR models. The spectra were sub-jected to piecewise pretreatment described in section 2.4.2. The number of the latent varia-bles was determined using leave-one-out cross-validation (LOOCV)."
(L190-191):
"The PLSR was carried out using the PLS_toolbox (Eigen-vector Research, Inc.) in the Matlab environment (The MathWorks, Inc.)."

6. Comments: *Authors should include RPIQ in Cu estimation models summary Table 2.*
Answers: Many thanks for your suggestion. We have added RPIQ in Table 2 as follows (L250-256):
"**Table 2.** Summary statistics for soil Cu estimation models with traditional spectral pretreatments.

Spectral pretreatment	Calibration		Validation				LVs
	R_{cv}^2	RMSE_{cv}	R_p^2	RMSEP	RPD	RPIQ	
None	0.64	9.72	0.75	8.86	1.83	2.07	6
MC	0.67	8.90	0.74	7.97	1.96	2.22	6
SG	0.64	9.75	0.75	8.51	1.84	2.08	6
FD	0.04	20.64	0.09	18.62	0.84	0.95	8
Lg	0.63	9.56	0.70	8.66	1.81	2.04	8
MSC	0.38	12.62	0.53	10.75	1.43	1.61	9
SNV	0.40	12.35	0.51	11.12	1.41	1.59	9

Note: MC denotes mean centering. SG denotes Savitzky–Golay smoothing. FD denotes first derivative. Lg denotes log(1/R). MSC denotes multiplicative scatter correction. SNV denotes standard normal variate. R_{cv}^2 denotes coefficient of determination in cross-validation. RMSE_{cv} denotes root mean square error in cross-validation. R_p^2 denotes coefficient of determination in prediction. RMSEP denotes root mean square error of prediction. RPD denotes the residual predictive deviation. LV denotes latent variable. RPIQ denotes the ratio of performance to interquartile distance."

7. Comments: Table 2 and Figure 4 presenting same results? I suggest to remove Figure 4.
Answers: Many thanks for your suggestion. We have deleted Figure 4.

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www.kgsupport.com
info@kgsupport.com
Phone/Fax +852 3018 1216
Address: 19B Wing Yee
Commercial Building, 5 Wing Kut Road, Hong Kong

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