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## A NEW METHOD FOR THE ESTIMATION OF REGIONAL BACKGROUND CONCENTRATION OF CO<sub>2</sub> IN YANGTZE RIVER DELTA, CHINA

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**A** new method was developed in order to estimate the regional CO<sub>2</sub> background concentration in Yangtze River delta (YRD), China. The sampling site, Lin'an Regional atmospheric background station, is in the Southern part of YRD. Both CO<sub>2</sub> and black carbon (BC) concentrations were simultaneously measured at the above site from 2013 to 2015, and the statistical analysis showed that they were moderately positively correlated. As the fossil fuel combustion and biomass burning are thought to be the predominant sources for CO<sub>2</sub> and BC presumably, a new method based on BC concentration combined with meteorological parameters was developed to estimate the regional CO<sub>2</sub> background concentration in YRD. In comparison to the results from statistical method by R package, this method is not only better at excluding the influence of air mass polluted by anthropogenic emissions, but also excels to represent the diurnal variation of CO<sub>2</sub> concentration caused by daily cycle of the plant photosynthesis/respiration and daily evolution of boundary mixing height. The annual regional CO<sub>2</sub> background concentration in YRD obtained by this new approach was about 404.7±8.2 ppm (2013), 405.6±5.3 ppm (2014) and 407.0±5.3 ppm (2015), respectively, significantly higher than the globally averaged concentration. The diurnal trend of CO<sub>2</sub> background concentration varied with the peak at 4:00 AM and the trough at 16:00 PM; the seasonal trend showed as a dual-modal curve, with the lowest value in August/September and the peaking point in January/February/May. In addition, it appears that the anthropogenic emissions could have a great impact on CO<sub>2</sub> concentration in this study area. In particular, when the air mass polluted by anthropogenic emission passed by, CO<sub>2</sub> concentration rose up significantly, about 9.1 ppm more than the background occurrence level.

### Biography

Jun He completed his PhD from National University of Singapore in 2009. Later, he worked as a Research Fellow in Singapore-Delft Water Alliance from 2009 to 2010, and then he moved to industry to work in Siemens Global Water R & D Centre as a Technology Scientist during 2010-2011. In Oct 2011, he took up the Lectureship in University of Nottingham Ningbo China (UNNC) and then got promoted to Associate Professor in Aug 2014. He is currently the Head of Natural Resources and Environment Research Group and Deputy Director of International Doctoral Innovation Centre in University of Nottingham Ningbo China (UNNC). He has so far published more than 45 peer-reviewed papers on top journals in the area of atmospheric science and climate change

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