## Elemental characteristics of airborne fine particles in an industrial area at a coastal city of central eastern China

WEI HU<sup>1</sup>, PINGQING FU<sup>1</sup>, TIANLI SONG<sup>2</sup>, YONGXIN FENG<sup>2</sup>, BORONG CHENG<sup>1</sup>, YELE SUN<sup>2</sup>, ZIFA WANG<sup>2</sup>

<sup>1</sup>Institute of Surface-Earth System Science, Tianjin University <sup>2</sup>Institute of Atmospheric Physics, Chinese Academy of Sciences

To investigate the characteristics of airborne fine particle (PM<sub>2.5</sub>) pollution in an iron and steel industrial area of Rizhao, a coastal city located in central eastern China and assess its effects on human health and ecosystems. concentrations of PM2.5 and elements in PM2.5 were measured using a continuous PM<sub>2.5</sub> mass and element monitor during September 2018. The average PM<sub>2.5</sub> concentration was  $27.8 \pm$ 23.0  $\mu$ g m<sup>-3</sup>, ranging from 3.8 to 217.9  $\mu$ g m<sup>-3</sup>. On average, the sum concentration of measured elements accounted for 18.1% of the total PM<sub>2.5</sub>. S, Fe, Si, Ca, K, Al and Cl were the most dominant elements. These elements may provide micronutrients for the growth of microbial community in adjacent sea surface waters and thus possibly influence the evolution and development of ocean ecosystems. Toxic elements such as As, Cd, Cr and Hg exhibited quite high concentrations, implying that the effect on human health should be paid attention to. Diurnal patterns of Fe, Pb, K, Cl, and Ti showed high concentrations at night and low concentrations in the daytime, indicating intense local emissions at night. Based on positive matrix factorization (PMF) analysis, sources including coal combustion, biomass burning, crustal dust, vehicular emission and metal processing were identified. These results provide scientific base for emission control and air quality management in coastal industrial areas, and further assessment on the effects of airborne particle pollution on human health and ecosystems is required.