

Abstract Submitted  
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**Impacts of Fine Particulate Matters on Atmospheric Ionic Mobilities in Direct Current Corona Discharges**<sup>1</sup> ZHILONG ZOU, LIYI LI, Harbin Institute of Technology — Ionic mobilities are significant parameters to reveal the physical linkage between ionization processes and movement characteristics of diverse ions in electric fields. An investigation into the impacts of fine particulate matters on atmospheric ionic mobilities is presented. A measurement apparatus was designed utilizing direct current (DC) corona discharges at room temperature. Ions were generated from parallel 50  $\mu\text{m}$  stainless steel wires applied to a high-voltage DC power supply. Fine particles with diameter magnitude of micrometers and even less were generated from burning insense in a closed laboratory and were analyzed by a scanning electron microscope (SEM, FEI Quanta 200F). Positive and negative ionic mobilities were extracted from the electric field strength and ion current density measured by the rotating field meter and ionic current plate respectively. With the presence of fine particles, atmospheric ionic mobilities were found to decrease exponentially with the increasing mass concentration of the particles. The distributions of electric field and space charge density, the contributions to the charge density from ions and fine particles were also attained.

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