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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Measuring condensation sink and ion sink of atmospheric aerosols with the electrical low pressure impactor (ELPI)" *by* H. Kuuluvainen et al.

Anonymous Referee #2

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Comments on the "Measuring condensation sink and ion sink of atmospheric aerosols with the ELPI" by Kuuluvainen, Kannosto, Virtanen, Makela, Kumala, Aalto and Keskinen

The manuscript proposed a new way of applying electrostatic low pressure impactor (ELPI) to measure the condensation and ion sinks of atmospheric aerosols. The ELPI electrically charges sampled aerosol, separate particles of different sizes with the impactor technique, and measure the separated particle concentration by a sensitive electrometer at each impaction stage. The manuscript discussed the principal foundation (from theoretical point of view) to establish such measurement and implemented

the principle by a set of data collected from the field studies. The proposed method for measuring the ion sink of atmospheric aerosol is of interest for aerosol characterization. It would be a good ELPI application if it proved to be viable. However, more testing in the both laboratories and fields will be needed to prove the proposed measuring principle. One major concern of using ELPI for proposed measurement is the effort of environmental factors such as the relative humidity and temperature on the ELPI performance. Since ELPI electrically charges particles by ions produced in corona discharge, working ions may vary as the environmental factors change. The working ions may also vary with the gas composition (with the inclusion of trace gases) of sampled particle stream. How the above-mentioned factors influence the ELPI performance remains undetermined.

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