



## **Measurement of the Chemical Composition of Atmospheric Ion Clusters with a new Atmospheric-Pressure-interface Time-of-Flight (APi-TOF) mass spectrometer: The ioniAPi-TOF**

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Atmospheric-Pressure-interface Time-of-Flight (APi-TOF) mass spectrometry is a technique especially suited to detect very low number concentrations of ions of a few hundred per cubic centimetre in the atmosphere and to identify their chemical composition.

The Atmospheric-Pressure-interface of a new prototype instrument, the ioniAPi-TOF from Ionicon Analytik GmbH, consists of two hexapole ion guides, followed by an Einzel-lens system and an orthogonal acceleration time-of-flight mass analyser. The resolution of the instrument is  $>2000$  for ions above  $m/z$  60 Th with a total ion transmission of about 1%. The hexapoles used in this instrument allow for an almost constant ion transmission over a much broader mass range compared to other APi-TOF instruments using quadrupole ion guides. In the context of atmospheric ion clusters, this means that not only high-mass cluster ions, but also the composition of precursor compounds and gas-phase impurities can be measured simultaneously. In addition, the use of hexapoles in the ioniAPi-TOF shows very little fragmentation of weakly bonded cluster ions.

Here we will present first results of the positive ion composition obtained under very well controlled conditions during the CLOUD 12 campaign in fall 2017 at CERN, studying the influence of galactic cosmic rays in new particle formation.

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