

Projectnr **CS4** Projecttitle **The regional climate impact of aerosols**
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A large cloud chamber to monitor the cloud-activation of ammonium-nitrate and ammonium-sulphate aerosol

Background

The regional aerosol in the Netherlands has a large proportion of ammonium-nitrate, which could be influential in forming clouds, see poster **“The importance of ammonium-nitrate aerosol as regional CCN-agent”**. The actual proof is in assessing the number of aerosol particles that contains ammonium-nitrate and form cloud droplets.

Approach

The activation of ammonium-nitrate is experimentally assessed in our cloud-chamber, see figure.

The cloud-chamber is unique because of its size and associated features:

Air is drawn in from outside and the number of droplets formed is similar to that in actual clouds

Note: commercial CCN-counters do not have this feature

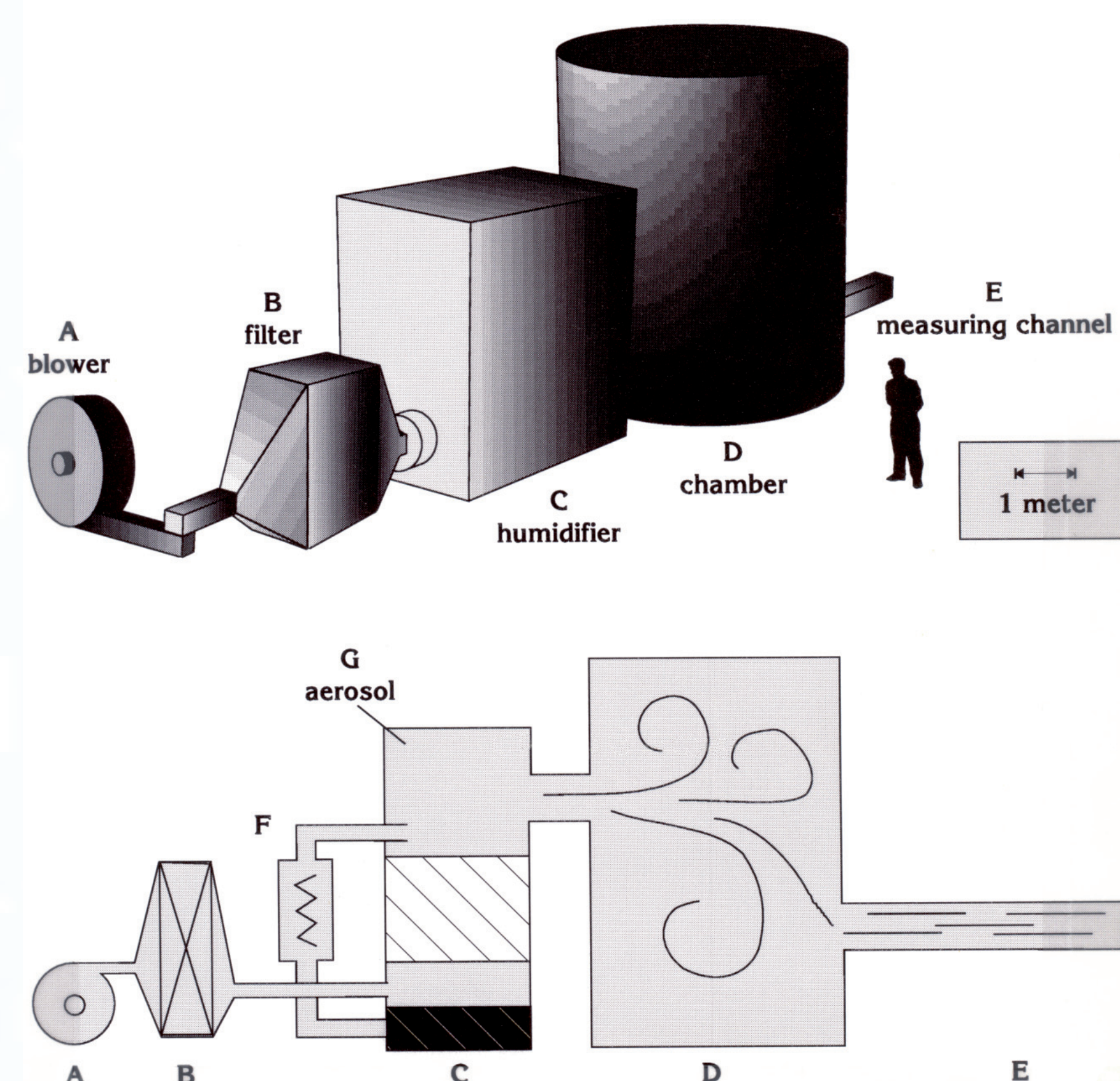
Number of aerosols and the amount of ammonium-nitrate is measured

The ammonium-nitrate is measured with novel monitor developed by ECN/Applikon: “MARGA-sizer”

The number and amount of ammonium-nitrate (and ammonium-sulphate) are determined **before and after the chamber**

The difference in number and content before and after the chamber provides the activation efficiency

SCHMATIC VIEW OF THE ECN CLOUD CHAMBER



Note: The chamber is also used for calibration of the commercial CCN (of KNMI) for project CS2 (CESAR).

Results

First NOVEL finding:

Ammonium-nitrate is more efficient in cloud formation than the “standard” ammonium-sulphate.

The reason is that ammonium-sulphate is in particles that are too small to act as Cloud Condensation Nuclei.