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## Experimental investigation of homogeneous freezing of sulphuric acid particles in the aerosol chamber AIDA

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**Abstract.** The homogeneous freezing of supercooled H<sub>2</sub>SO<sub>4</sub>/H<sub>2</sub>O solution droplets was investigated in the aerosol chamber AIDA (Aerosol Interactions and Dynamics in the Atmosphere) of Forschungszentrum Karlsruhe. 24 freezing experiments were performed at temperatures between 189 and 235 K with aerosol particles in the diameter range 0.05 to 1 µm. Individual experiments started at homogeneous temperatures and ice saturation ratios between 0.9 and 0.95. Cloud cooling rates up to -2.8 K min<sup>-1</sup> were simulated dynamically in the chamber by expansion cooling using a mechanical pump. Depending on the cooling rate and starting temperature, freezing threshold relative humidities were exceeded after expansion time periods between about 1 and 10 min. The onset of ice formation was measured with three independent methods showing good agreement among each other. Ice saturation ratios measured at the onset of ice formation increased from about 1.4 at 231 K to about 1.75 at 189 K. The experimental data set including thermodynamic parameters as well as physical and chemical aerosol analysis provides a good basis for microphysical model applications.

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