Anmeldung eines Themas für eine Bachelorarbeit

Thema Datum	Comparison of measured dendrite trajectories with experimental results 10.01.2025
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Kurzbeschreibung:	The orientation of ice crystals significantly affects their microphysical behaviour, growth and interaction with electromagnetic radiation, which in turn affects remote sensing signals. However, the dynamics of the movement of ice crystals in the atmosphere are not well understood because they have complex and often irregular shapes that allow for a wide variety of motion. In a previous study (Stout et al. 2024), the falling behaviour of 3D-printed plate-like ice crystal analogues was analysed and categorised into stable, zigzag, transitional and spiral regimes. Crystals such as those used there can also be identified in datasets measured by an in-situ snowfall camera system (Maahn et al. 2024) in field campaigns. The aim of this bachelor thesis is to compare the trajectories of these dendritic ice crystals with the theoretical framework established in Stout et al. 2024. To this end, the specific fall regimes present in the measured data will be identified, statistically analyzed and related to different size regimes and atmospheric conditions. Data from Hyytiälä, Finland, Ny-Ålesund, Svalbard and Colorado, USA can be used for this purpose.  Dendritic ice crystals observed by the snowfall camera.

Literatur:	Stout, J. R., Westbrook, C. D., Stein, T. H. M., & McCorquodale, M. W. (2024). Stable and unstable fall motions of plate-like ice crystal analogues. Atmospheric Chemistry and Physics, https://doi.org/10.5194/acp-24-11133-2024 Maahn, M., Moisseev, D., Steinke, I., Maherndl, N., & Shupe, M. D. (2023). Introducing the Video In Situ Snowfall Sensor (VISSS). Copernicus GmbH. https://doi.org/10.5194/egusphere-2023-655