Precipitation sublimation in Switzerland

Precipitation is a key component of the water cycle. Any novel knowledge, both physical or statistical, on the processes and mechanisms taking place in precipitation are thus beneficial to better understand it, model it, quantify it and eventually forecast it. When the lower level of the atmosphere is not saturated in humidity, the precipitation (snow, rain) forming aloft will (at least) partially sublimate before reaching the ground. If the sublimation is not partial but total, the phenomenon is visible as *virga* falling from the cloud (see figure below\(^1\)).

Statistics on the occurrence and quantification of low-level sublimation in Switzerland do not exist yet, as well as information about the spatial distribution of this phenomenon and the large / local scale features associated to it: for example the presence of dry air masses at the bottom of Alpine valleys below large scale precipitating systems or local dry wind patterns (e.g. Foehn).

Figure 1: (a) Virga precipitation (b) Balloon-sounding data visualizing processes connected to virgae (with a visible low-level subsaturated layer)

Objectives

- Identify sublimation cases from weather radar and pluviometer data (supported by MeteoSwiss)
- Analysis on occurrence, magnitude, seasonality of sublimation
- Link with atmospheric structure/processes
- Possible impacts on weather radar data interpretation

Profile

- High motivation and independent working ability
- Experience in Python
- Knowledge or motivation towards atmospheric sciences
- Experience in data processing

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\(^1\)Source of Fig.1a: www.weatherwizkids.com, Fig.1b: www.meteoschweiz.admin.ch