



meteomatics

Your Experts in Weather Data Processing.

CIMMS

UAS workshop

Dr. Martin Fengler

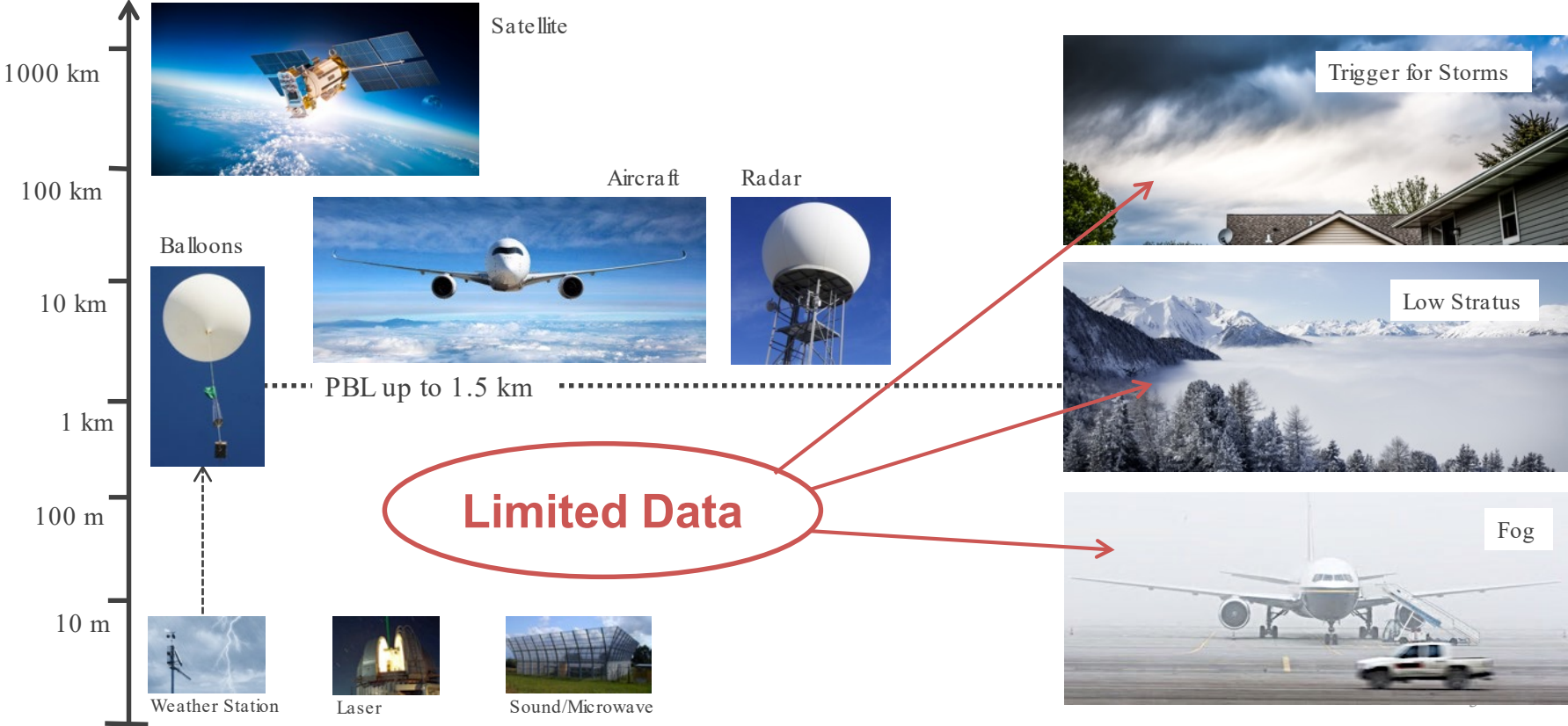
CEO

World Class Talent in Meteorology, Data Science, Drone Development and Service Delivery

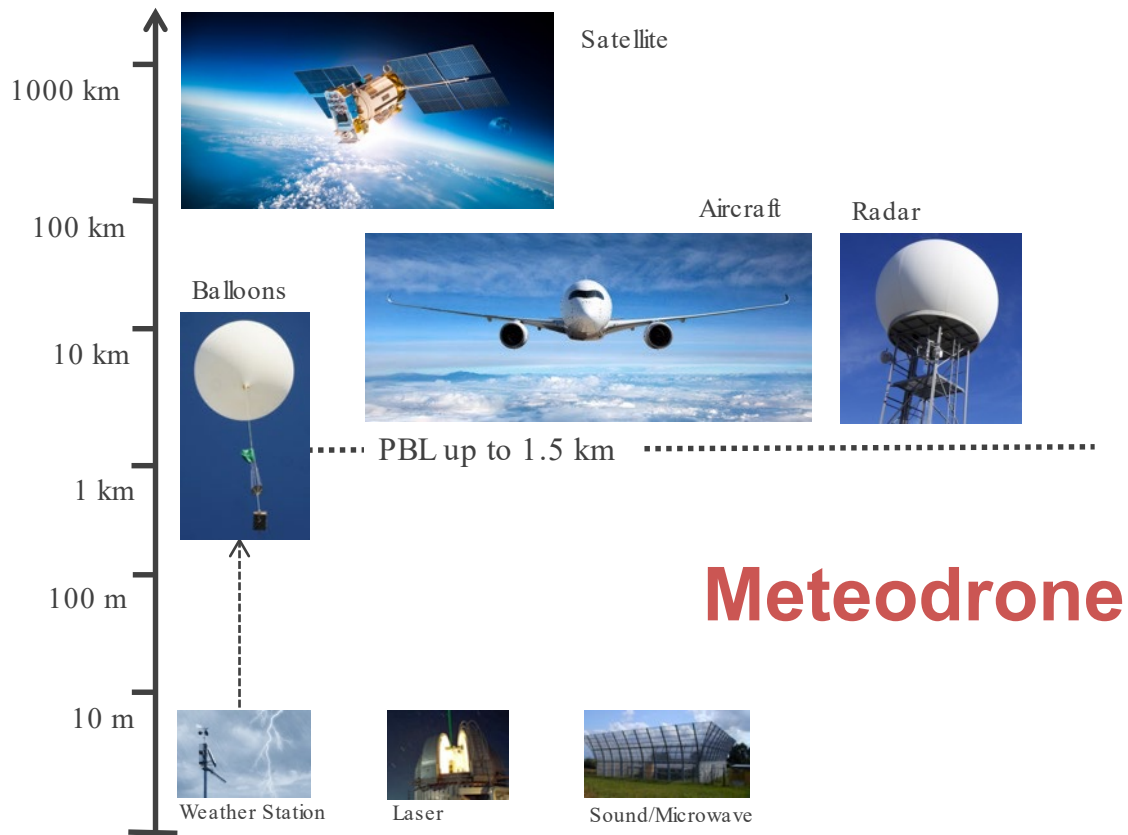
We are proud of Meteomatics' fair, hardworking, 'can-do' culture and a highly skilled multi-disciplinary team who rise to the challenge with our customers in a positive fashion. Creativity is a core skill whether it be in thinking, design, architecture or science.



Current PBL Data Situation



Improving PBL Data Situation




Meteodrone



Meteodrone Systems




Meteodrone SSE

Max. wind speed: 75 km/h
Flight altitude: 1'500 m AGL
Ø : 40 cm;  : 0.7 kg




Meteodrone Classic

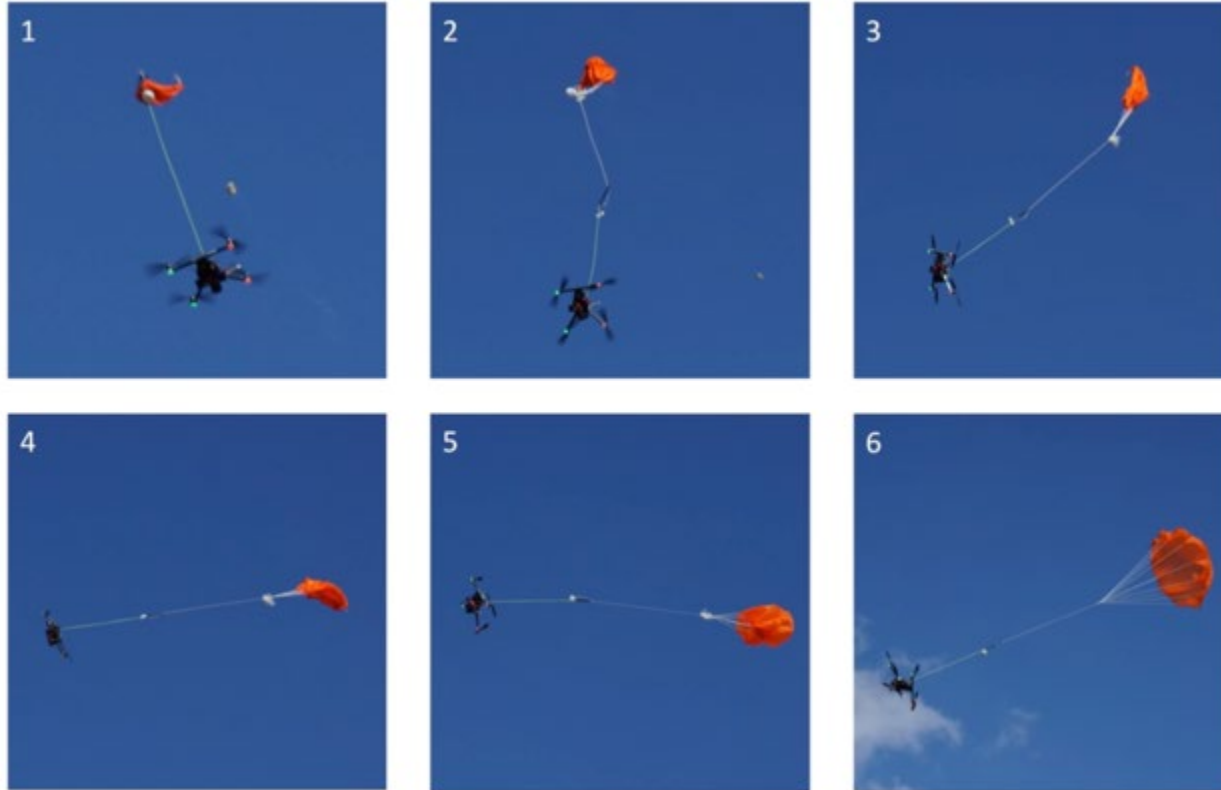
Max. wind speed: 60 km/h
Flight altitude: 3'000 m AGL
Ø : 60 cm;  : 1.5 kg



Meteodrone XL

Max. wind speed: 40 km/h
Flight altitude: 3'000 m AGL
Ø : 70 cm;  : 5 kg

Emergency rescue system (ERS)



ERS at high wind speeds

Meteodrone Classic – BVLOS Approved



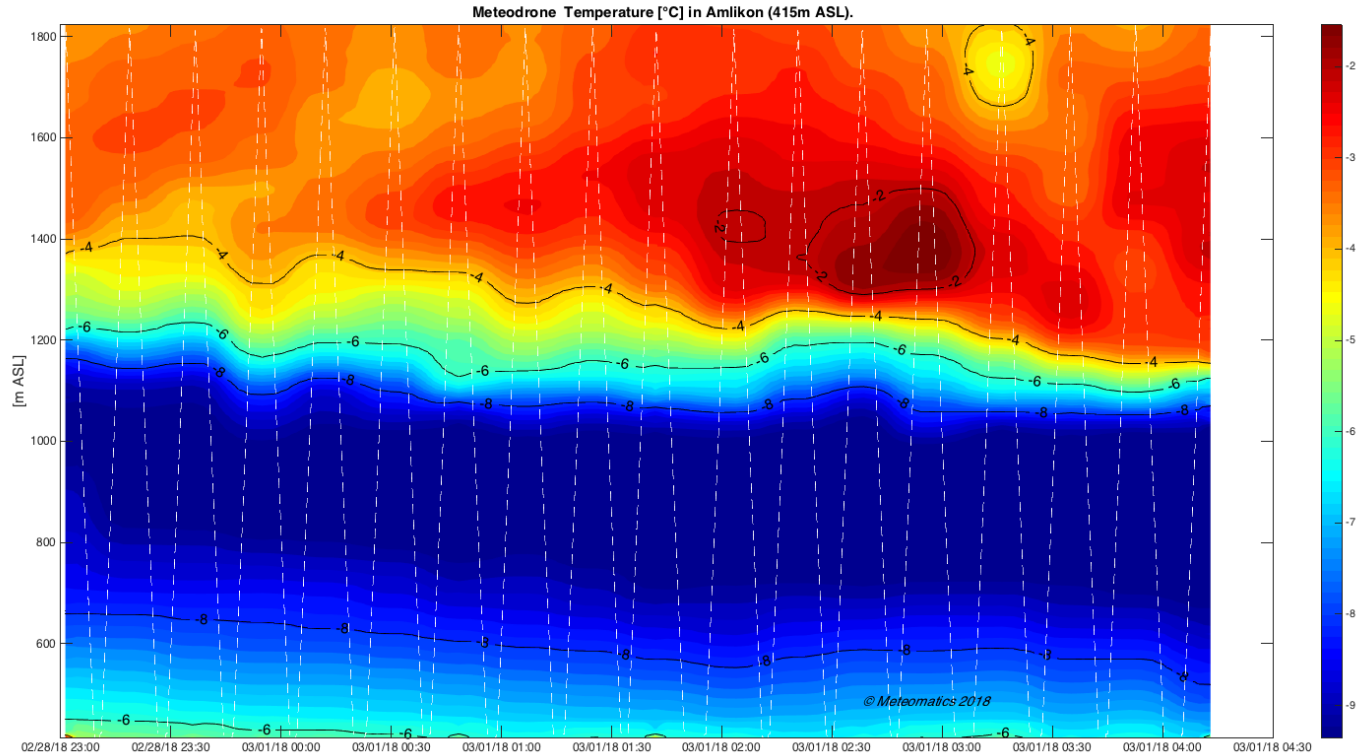
> 3'000 Flight Hours
under BVLOS conditions

> 18'000 Vertical Profiles

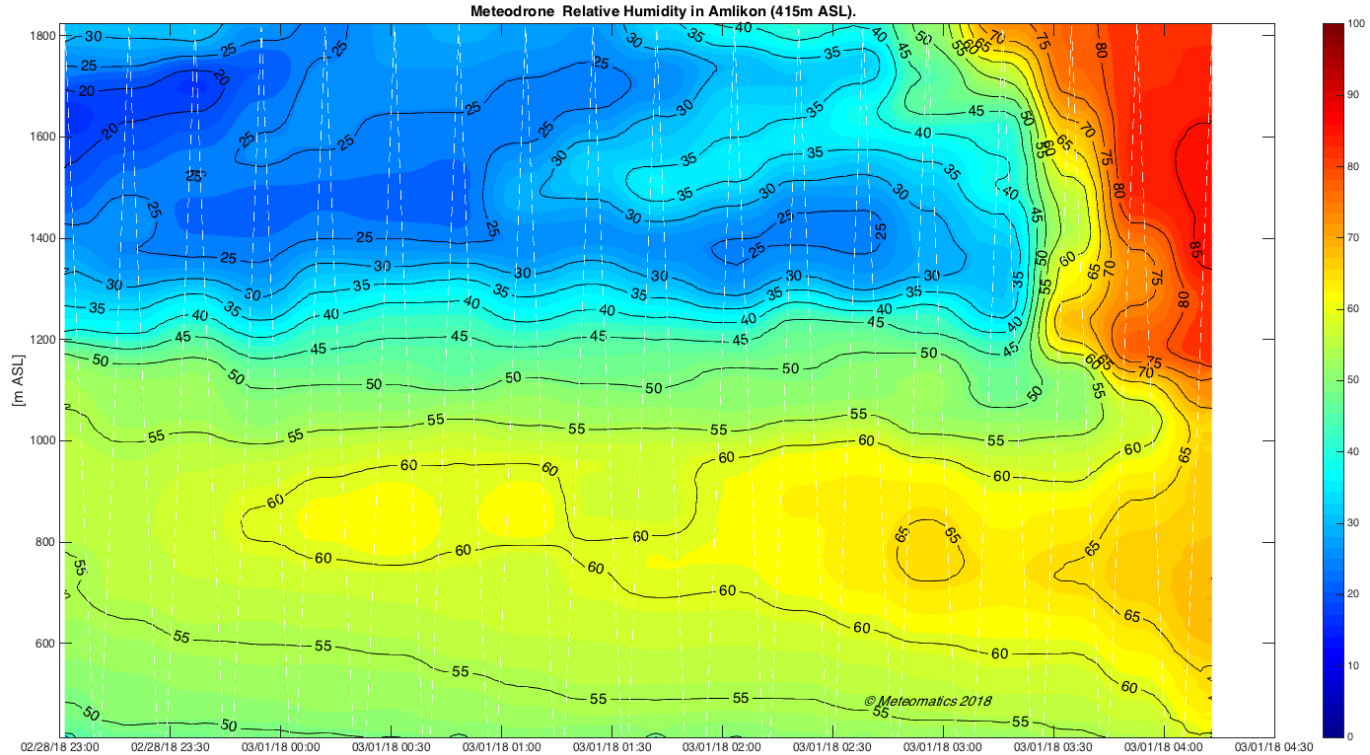
> 2'500 SWISS1k Model Runs

Several Patents Filed & Awarded

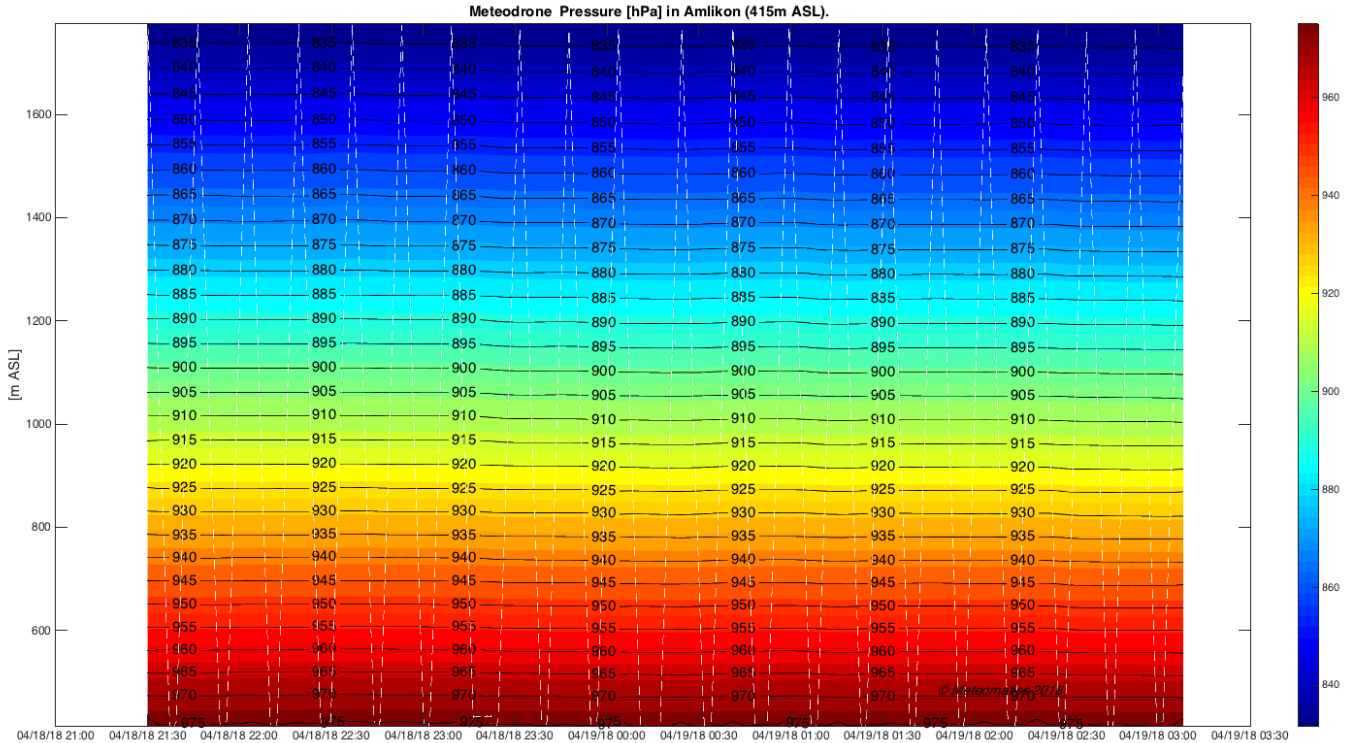
Amlikon 28.2./1.3.2018 – temperature



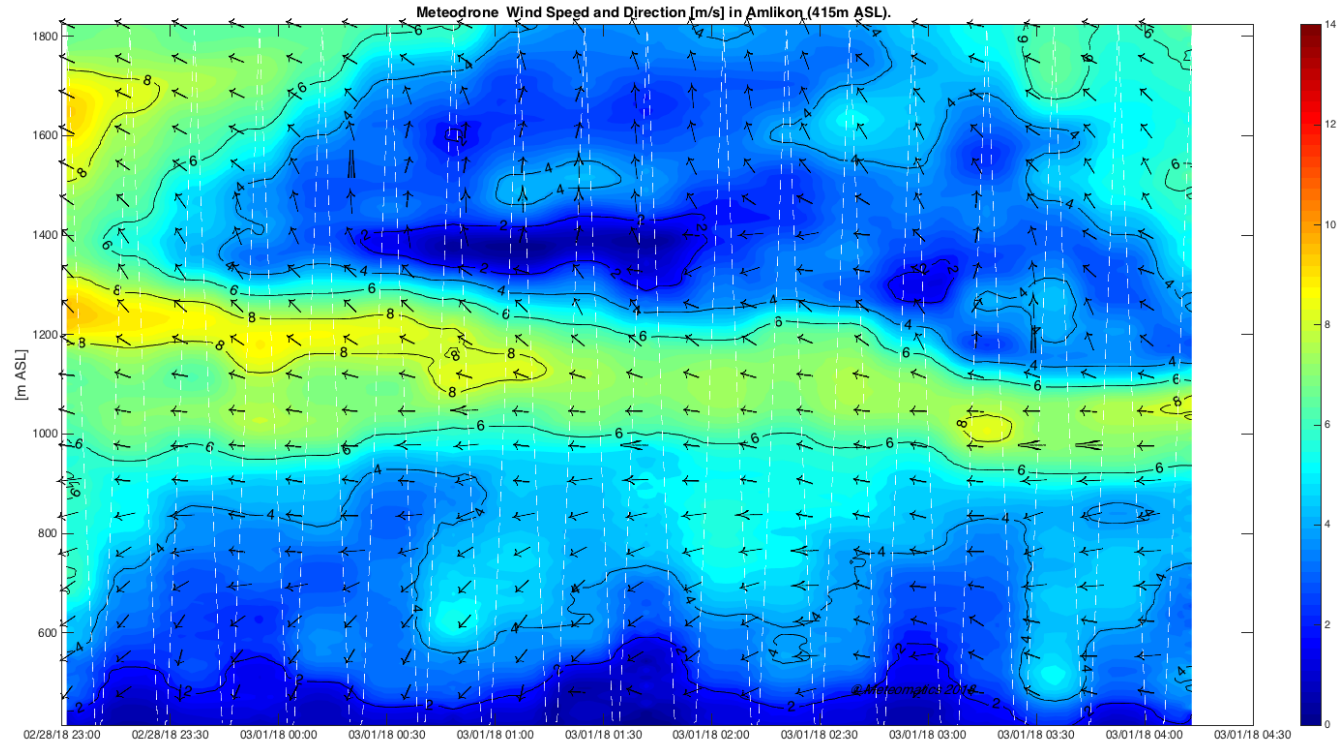
Amlikon 28.2./1.3.2018 – relative humidity



Amlikon 18.4./19.4.2018 – pressure

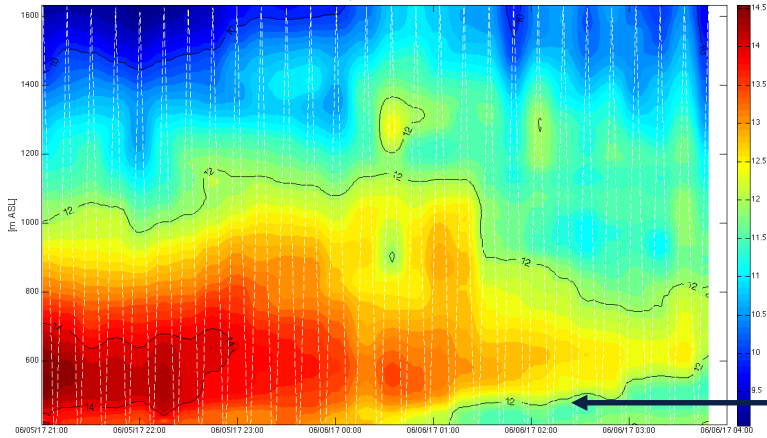


Amlikon 28.2./1.3.2018 – wind speed & direction



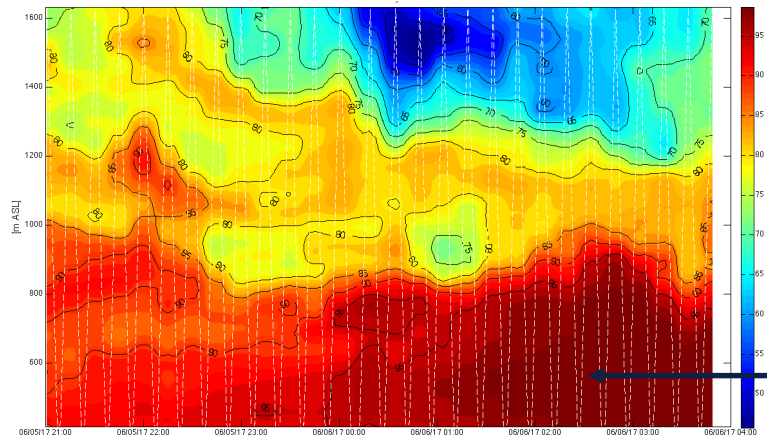
Amlikon 05. – 06.06.17

Temperature in Amlikon.



Temperature

Ground Inversion



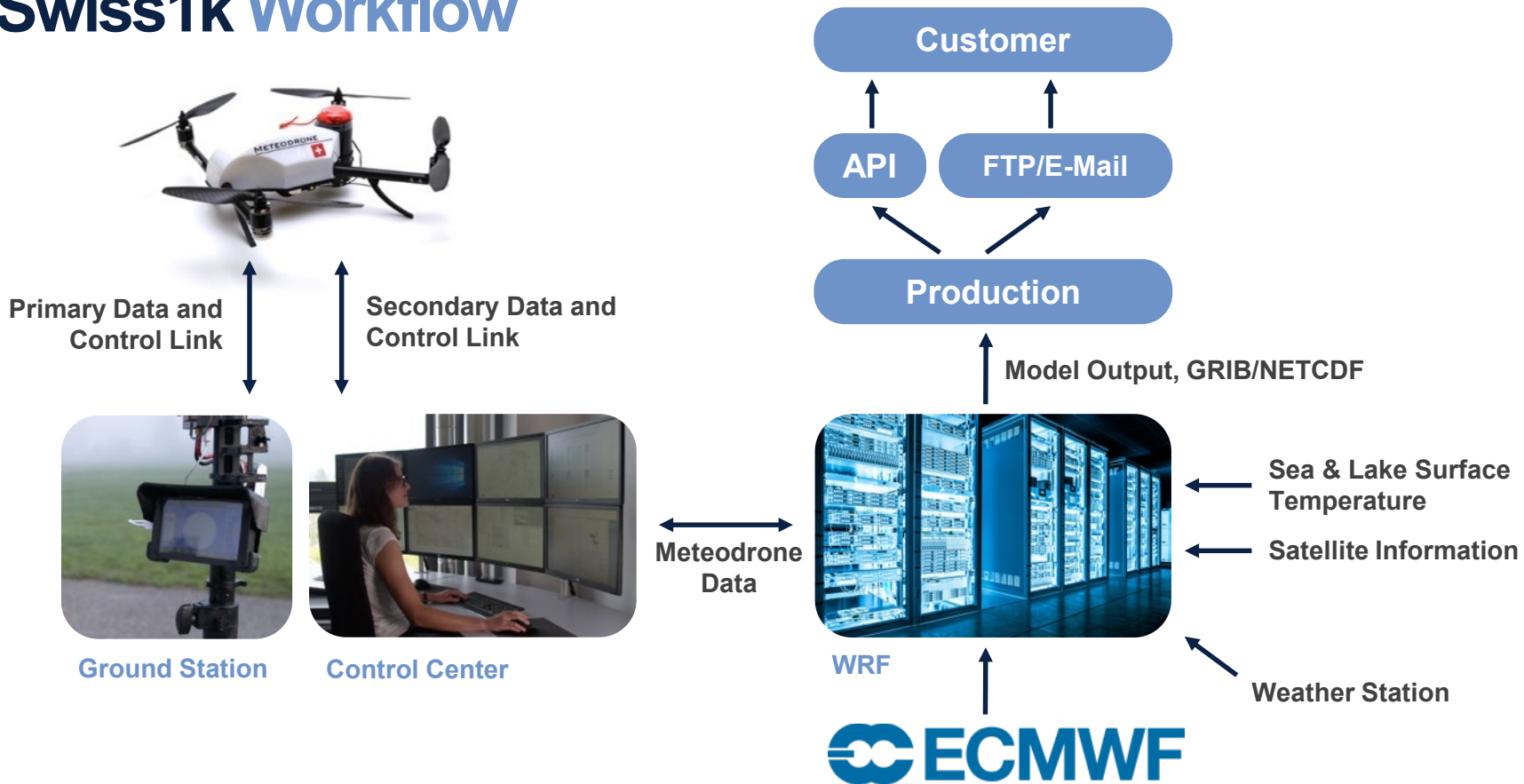
Relative Humidity

100% RH



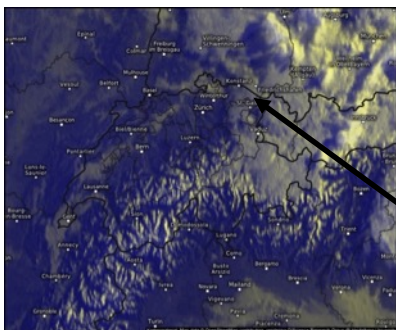
Shallow Fog:
Up to 150 m

Swiss1k Workflow



Morning Fog at Lake Constance 05.04.17, 5Z & 6Z

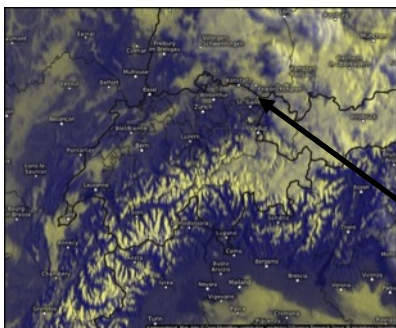
Satellite Cloud Cover



Swiss 1k **Without**
Meteodrone Data



Swiss 1k **With**
Meteodrone Data



Swiss 1k **Without**
Meteodrone Data



Swiss 1k **With**
Meteodrone Data



Meteodrones in
Schaffhausen, Amlikon
and Marbach until 3Z

Project DETAF

DETAF (Drone Enhanced Terminal Aerodrome Forecasts)

- Operating drones in 6 locations in the vicinity of and at Zurich airport
- Feeding data in real-time into Swiss 1k
- Sending visibility & ceiling forecasts to Skyguide

Funded by:



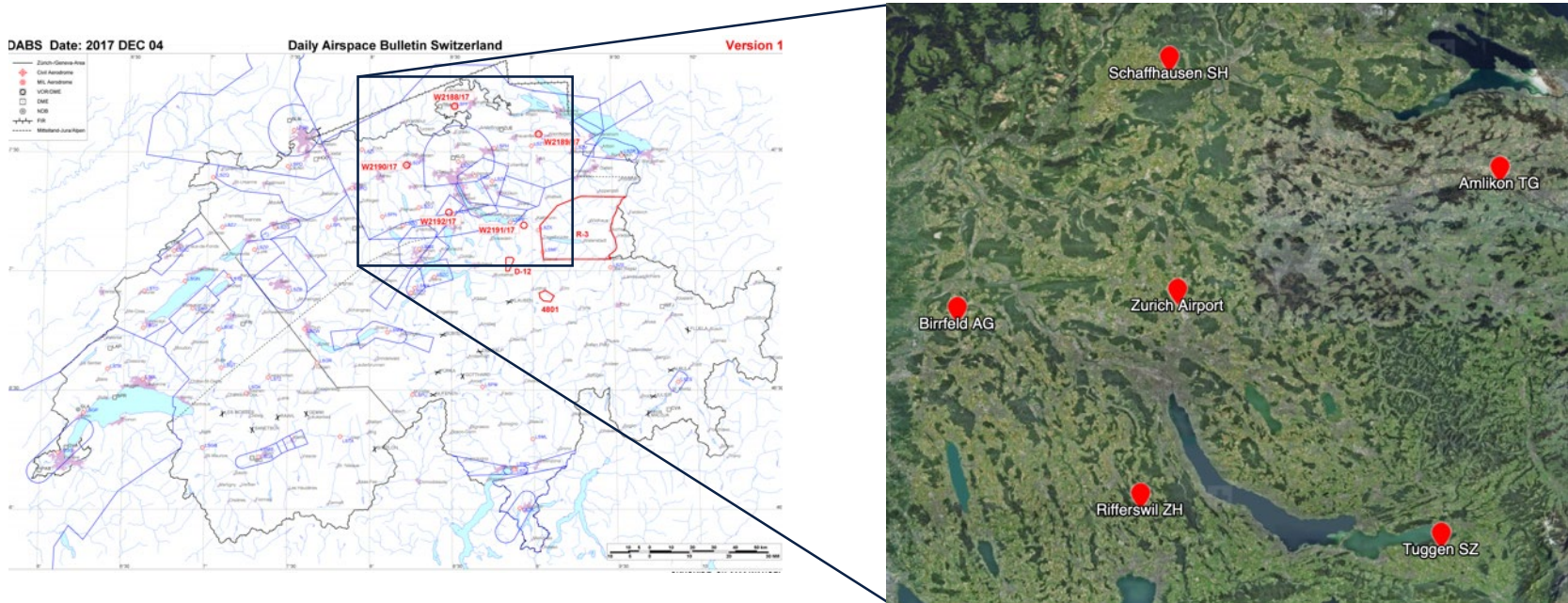
ZÜRICH AIRPORT



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

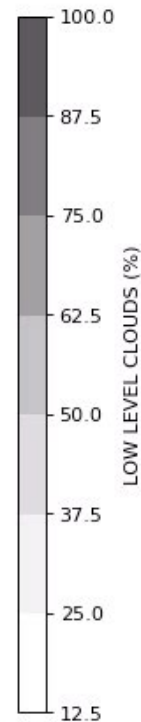
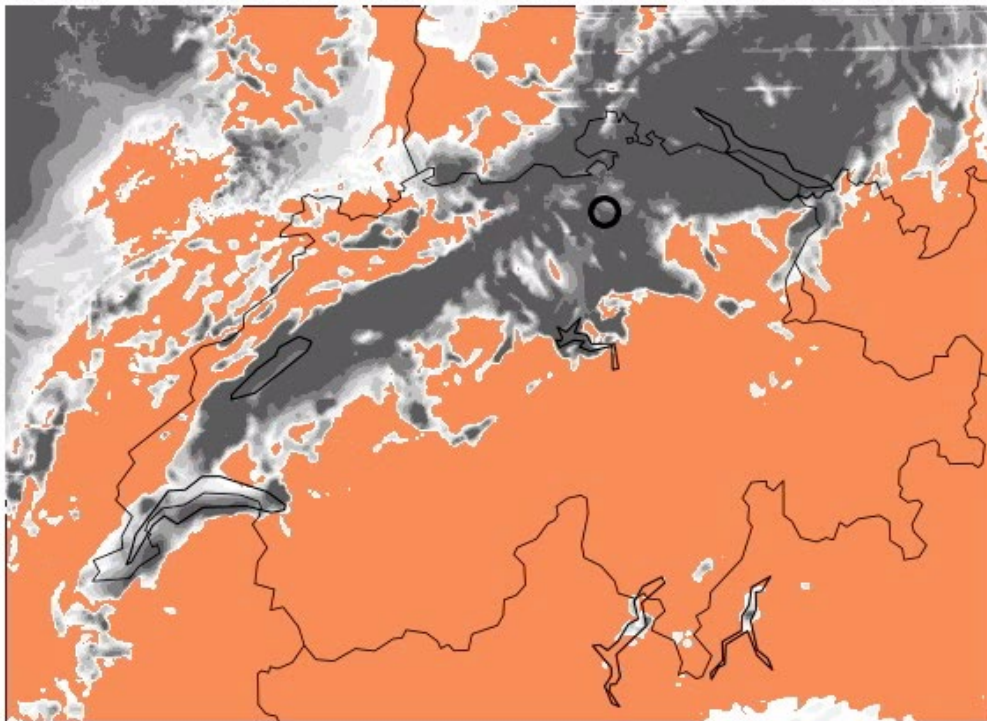
Bundesamt für Strassen ASTRA

DETAF 1.0 Setup

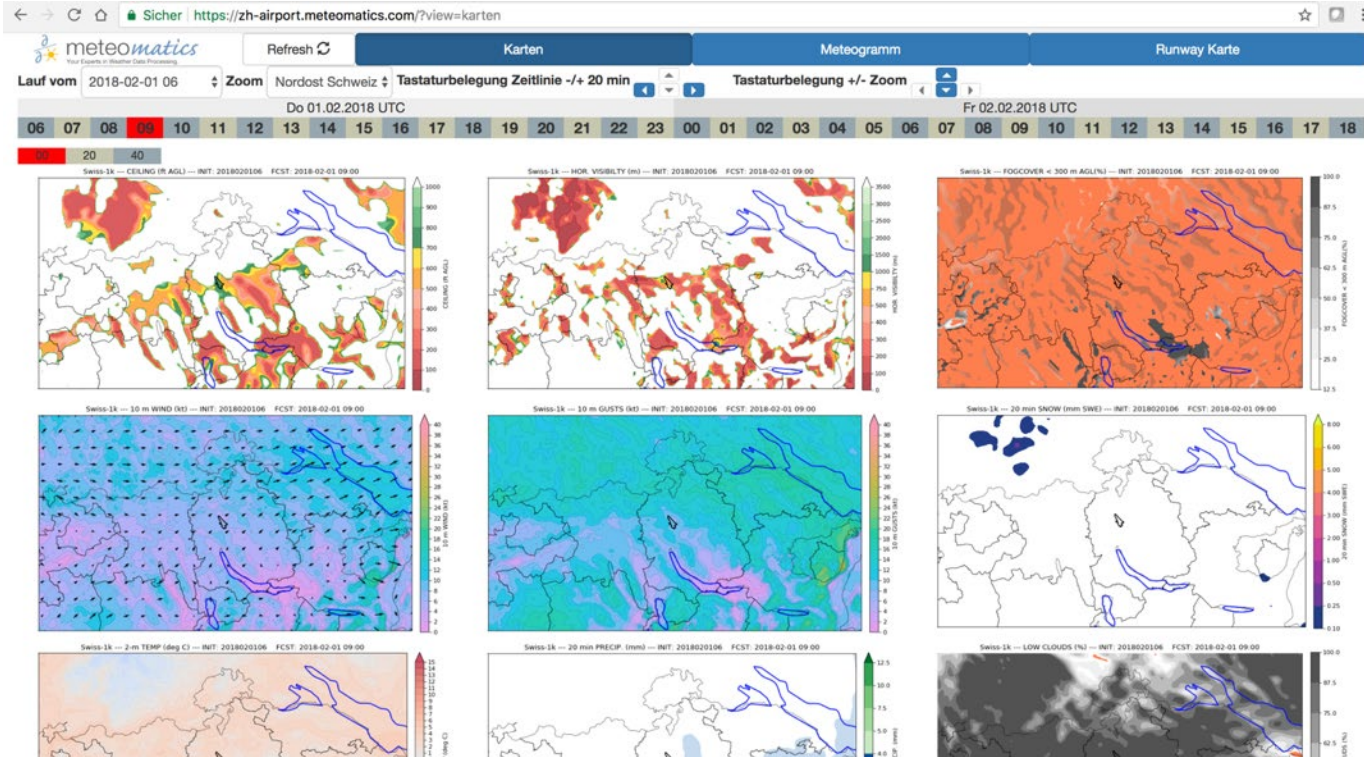


Swiss1k – Fog & Low Clouds

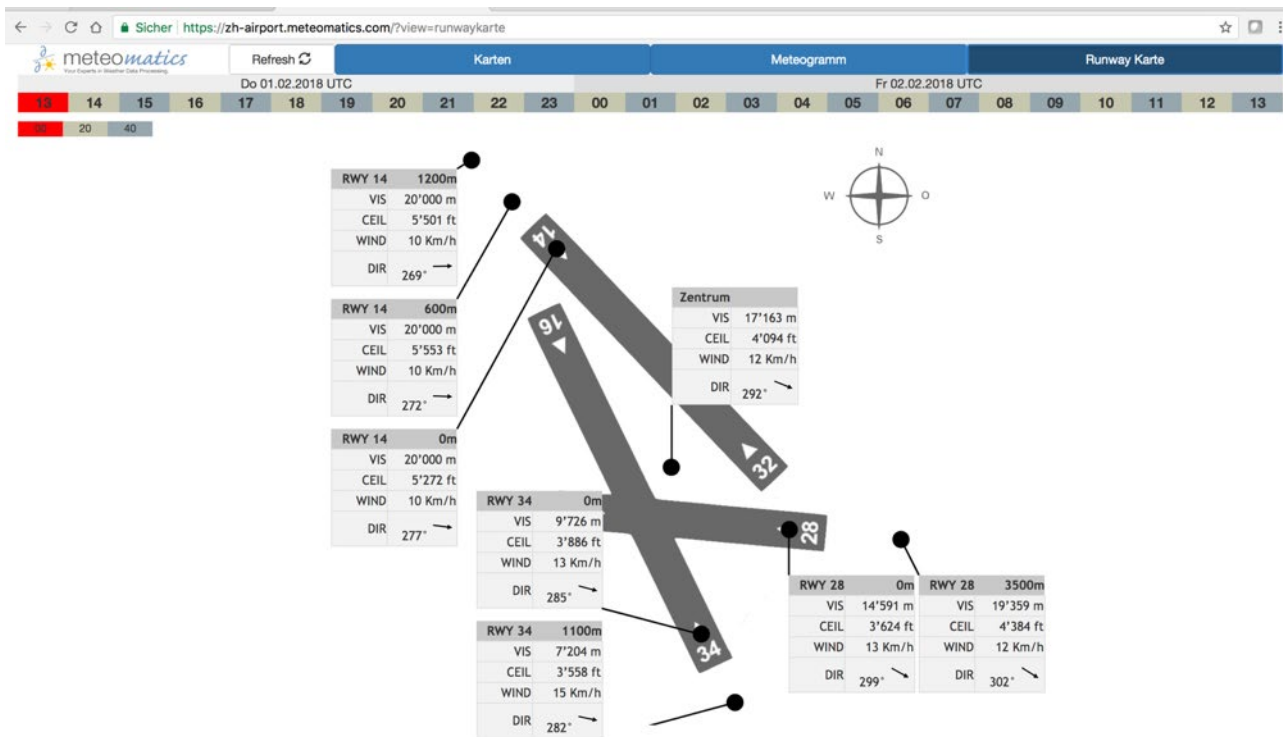
Swiss-1k --- LOW LEVEL CLOUDS (%) --- INIT: 2017120618 FCST: 2017-12-06 18:40



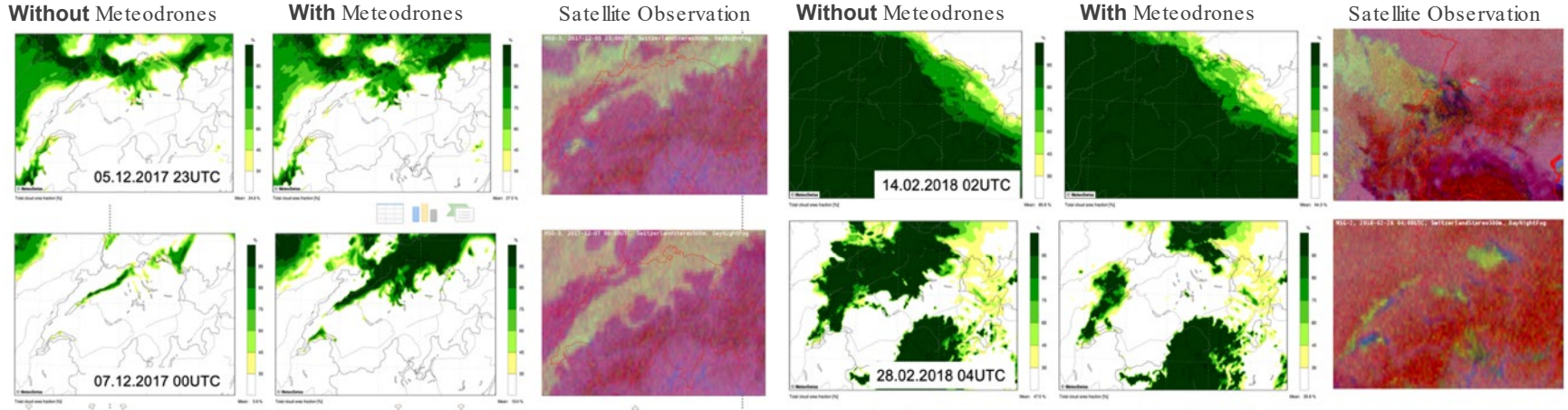
Zurich Airport Cockpit



Zurich Airport Runway Chart



MeteoSwiss Tests



Date	Weather Situation	Impact on COSMO Cloud Analysis
2017-12-05	High pressure system, low Large-Scale Forcing	Positive
2017-12-06	High pressure system, low LSF	Strongly Positive
2018-02-13	Border of high pressure system, medium LSF	Neutral
2018-02-14	Border of high pressure system, medium LSF	Neutral
2018-02-15	Frontal passage, strong LSF	Neutral
2018-02-26	Border of high pressure system, medium LSF	Neutral
2018-02-27	High pressure system, low LSF	Strongly Positive

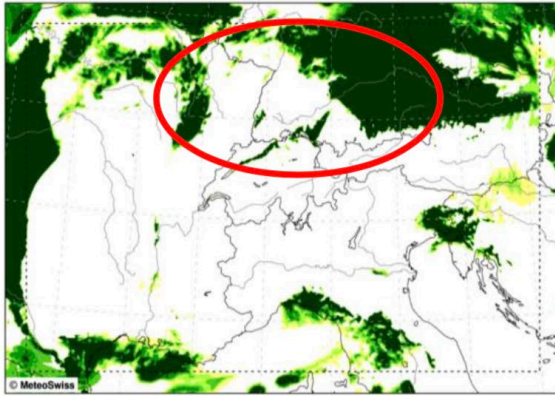
Conclusion

- Meteodrone Profiles have a very positive impact on COSMO analyses
- It demonstrates the importance of PBL T and RH observations in fog situations
- Most positive impact found in cases of weak large-scale forcing

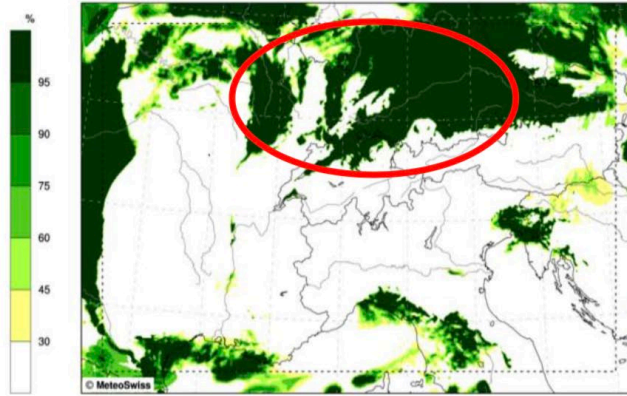


Forecasts of Cloudiness

Without Meteodrones

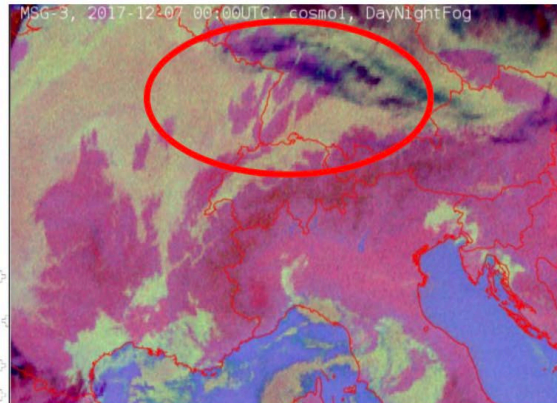


With Meteodrones



Satellite Observation

2017-12-07 00UTC +00h



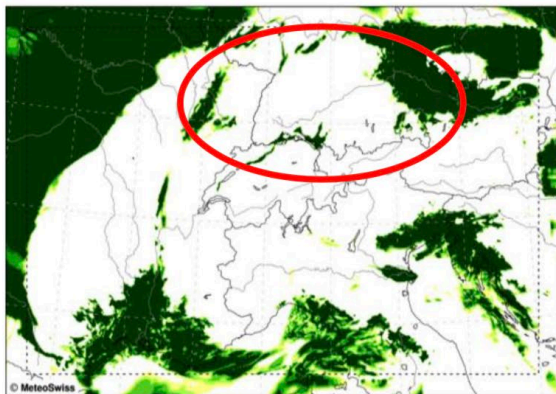
*Thanks to
Daniel
Leuenberger &
Co.!*



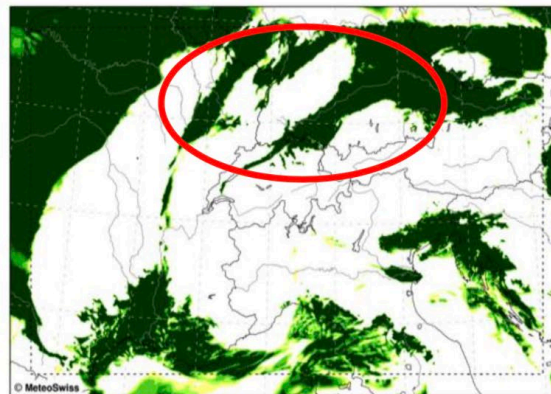


Forecasts of Cloudiness

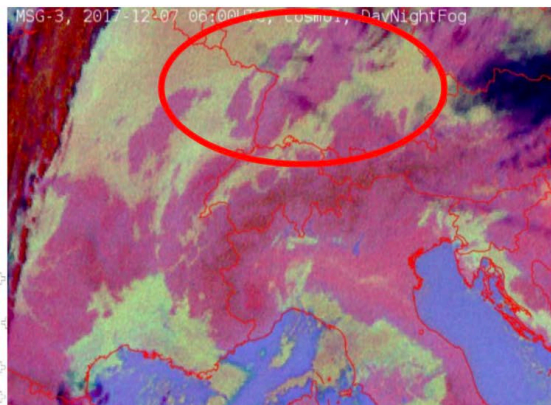
Without Meteodrones



With Meteodrones



Satellite Observation



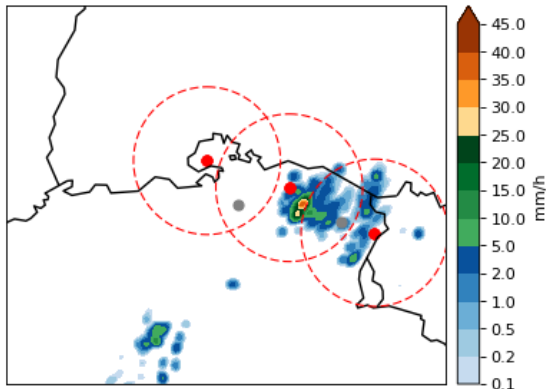
2017-12-07 00UTC +06h



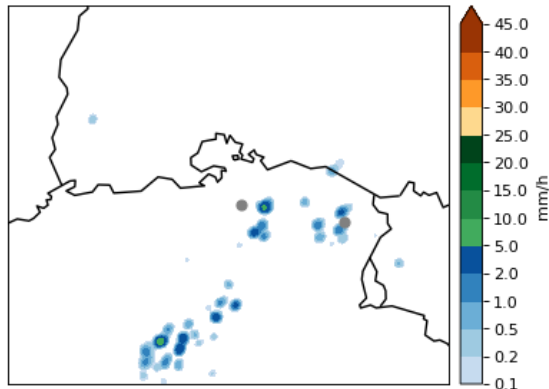
*Thanks to
Daniel
Leuenberger &
Co.!*

Thunderstorms in St.Gallen 29. – 30.05.17

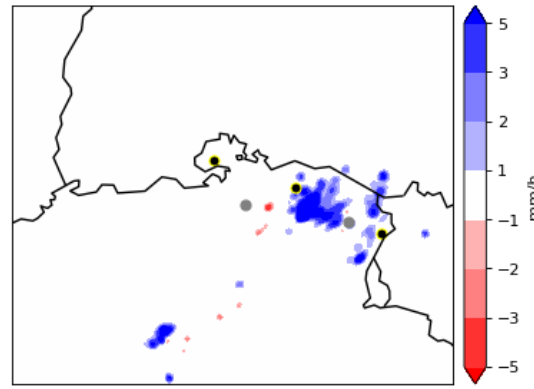
With Meteodrone
29.05.17



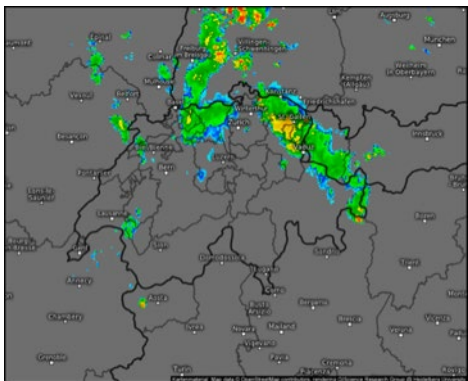
Without Meteodrone
29.05.17



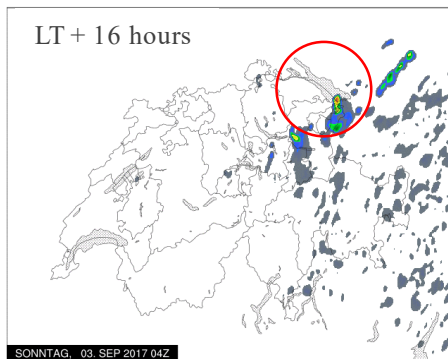
Difference
29.05.17



Swiss1k was the only model to capture these storm cells and forecasted them 23 hours ahead!

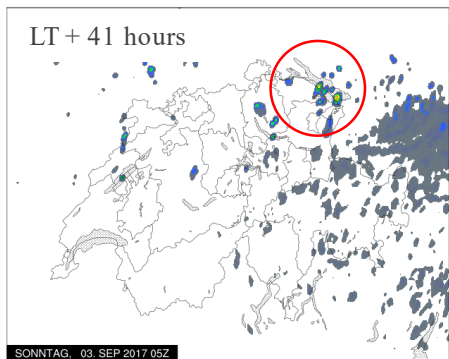


Waterspouts at Lake Constance 03.09.17



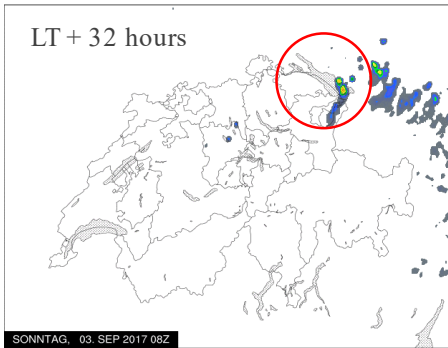
Modell: SWISS1K
Run: 02. SEP 2017 12Z
Offset: 016

Radar Reflectivity [mm/h]



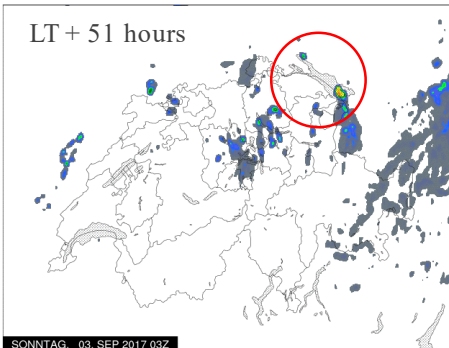
Modell: SWISS1K
Run: 01. SEP 2017 12Z
Offset: 041

Radar Reflectivity [mm/h]



Modell: SWISS1K
Run: 02. SEP 2017 00Z
Offset: 032

Radar Reflectivity [mm/h]



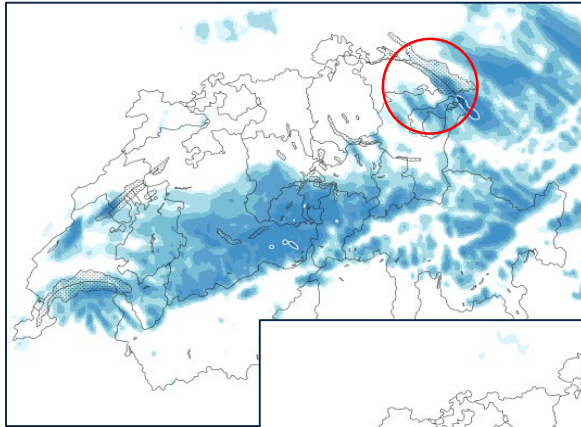
Modell: SWISS1K
Run: 01. SEP 2017 00Z
Offset: 051

Radar Reflectivity [mm/h]

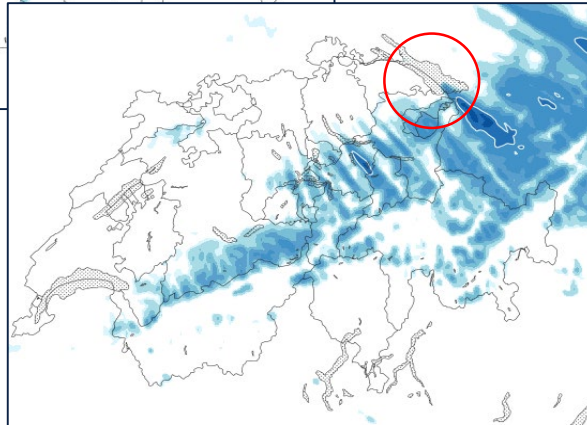


Swiss1k was the only model consistently showing the waterspout pattern through all model runs:
Over > 51 hours ahead!

Resolving “Lake Effect” Lake Constance

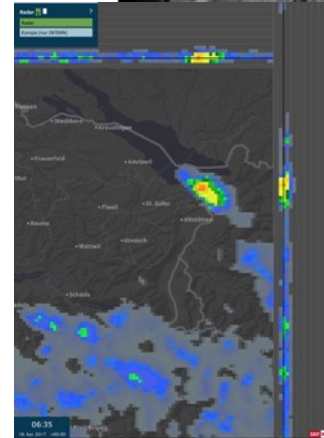


18.04.17



Unfall mit 10 Autos auf A1 wegen Schneeregen

Auf der A1 bei Meggenhus SG staut sich der Verkehr. Wegen rutschiger Fahrbahn sind Fahrzeuge kollidiert.



A1 bei Meggenhus SG sind zehn
) Bild: Leser-Reporter 20 Minuten. (2

anton St. Gallen hat sich im Morgenverkehr Unfall mit mehreren Einzelkollisionen Autos und zwei Lieferwagen sind in den Unfall Gian Andrea Rezzoli von der Kantonspolizei frage von Bernerzeitung.ch/Newsnet. Die neten sich von St. Gallen aus in Fahrtrichtung irra einen Kilometer vor dem Rastplatz einer Länge von ungefähr 200 Metern.



Artikel zum Thema

Zuger Polizei ver an Unfall-Gaffer

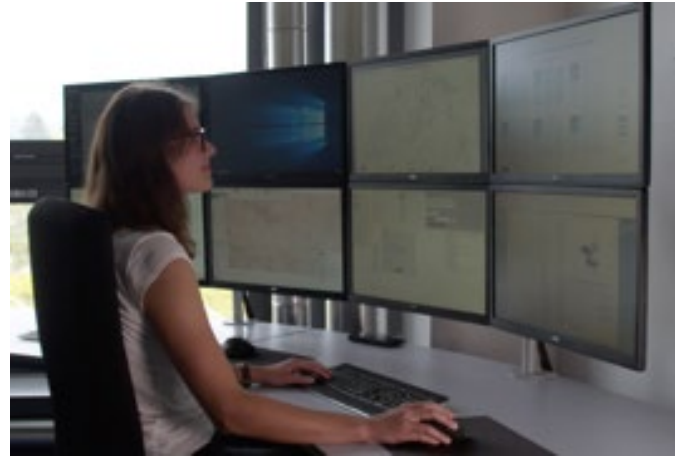


Im Kanton Zug hatten s Verkehrsunfälle ereigne Vorbeifahren sein Hand filmte, musste mit eine Mehr...
08.04.2017

MeteoBase – A Remote Platform



Currently in Final Production Tests



Our Future Flight Operation Center

Meteobase deployment at Illgraben



ETH zürich



SBB CFF FFS



swisscom

AMBERG
LOGLAY



Meteobase deployment at Illgraben

Successor of
Meteodrone Classic

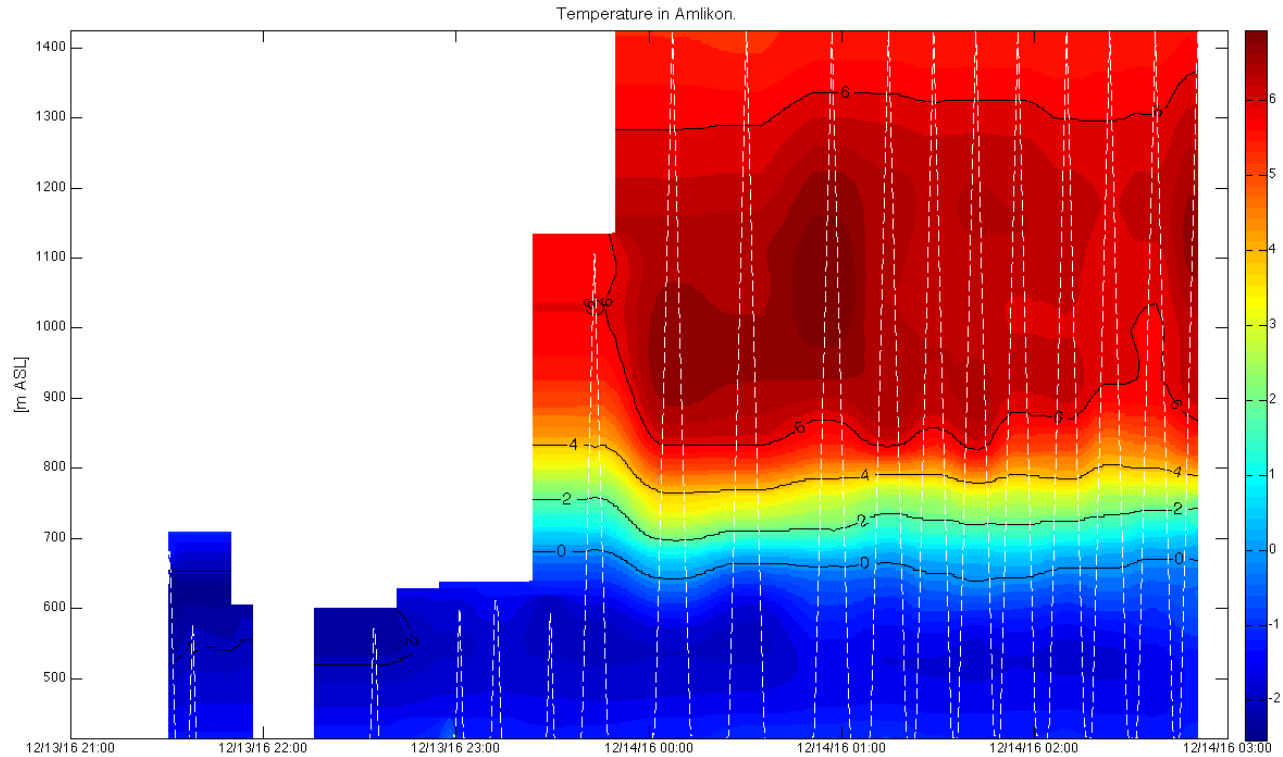




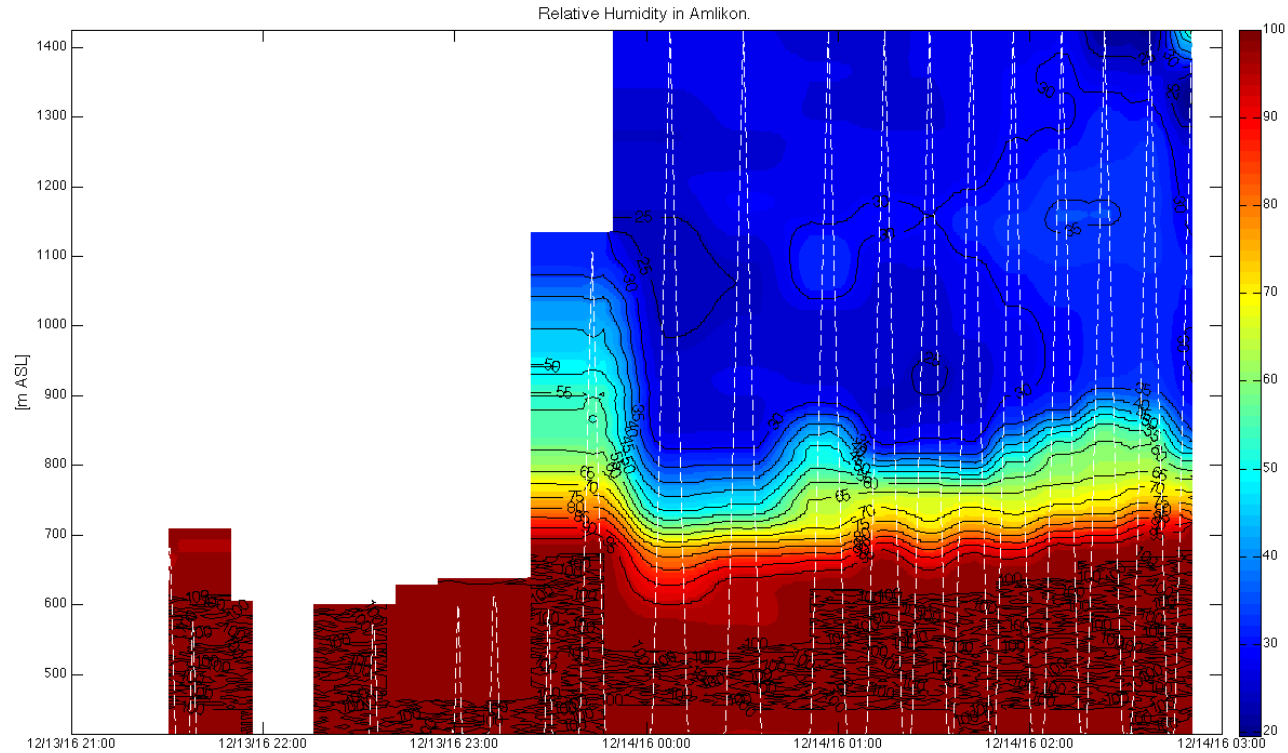
 *meteomatics*
Your Experts in Weather Data Processing.

METEOBASE

Amlikon 13.12./14.12.2016 - Icing

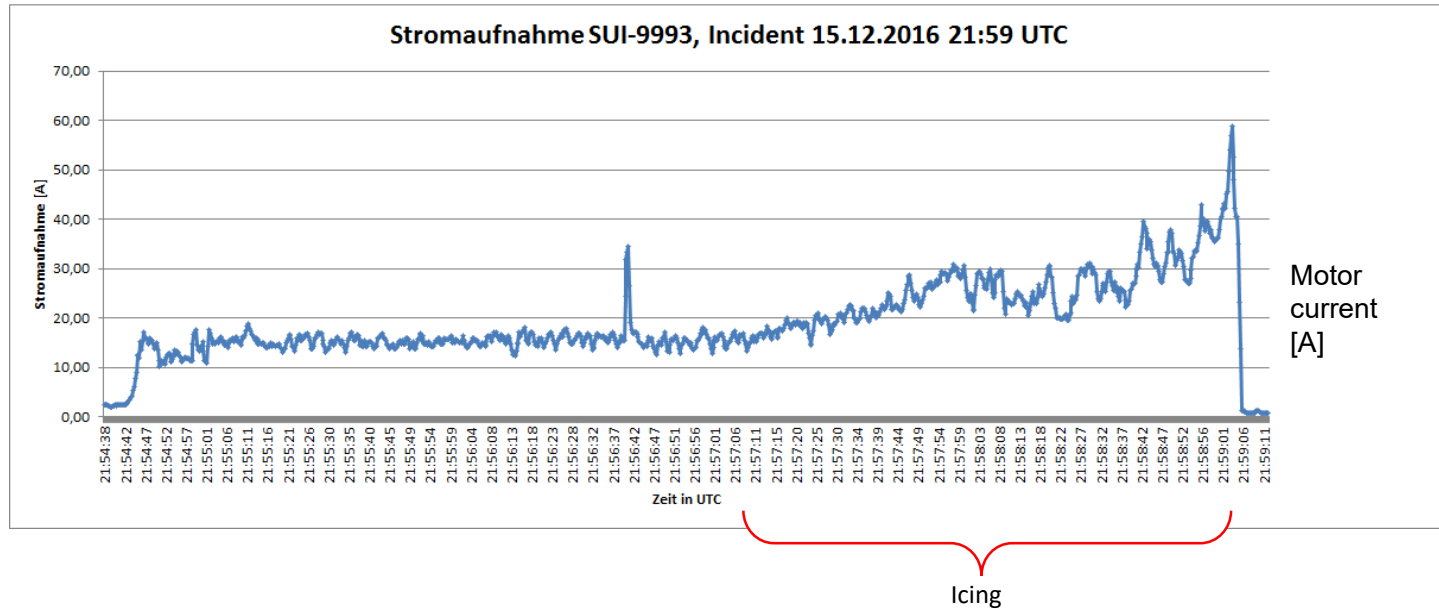


Amlikon 13.12./14.12.2016 - Icing

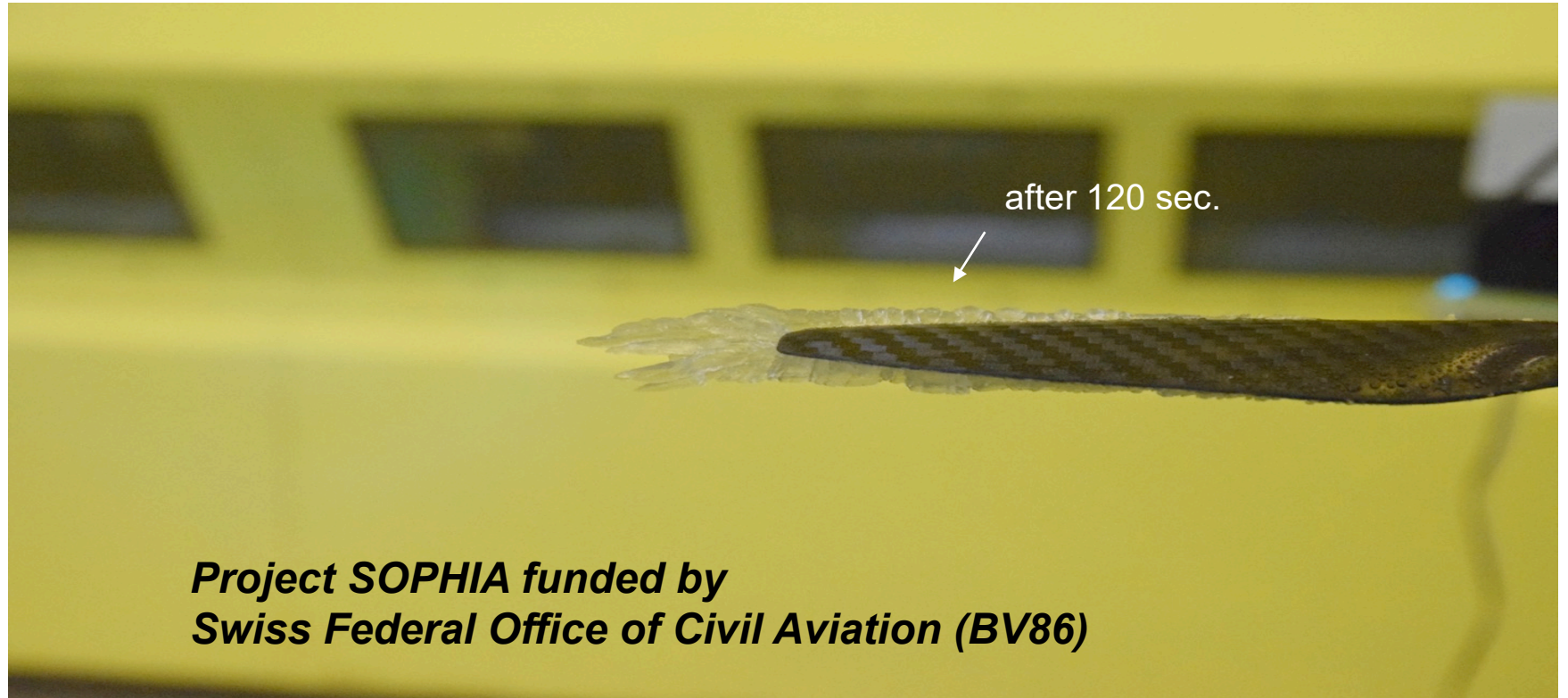


Test flights under real icing conditions

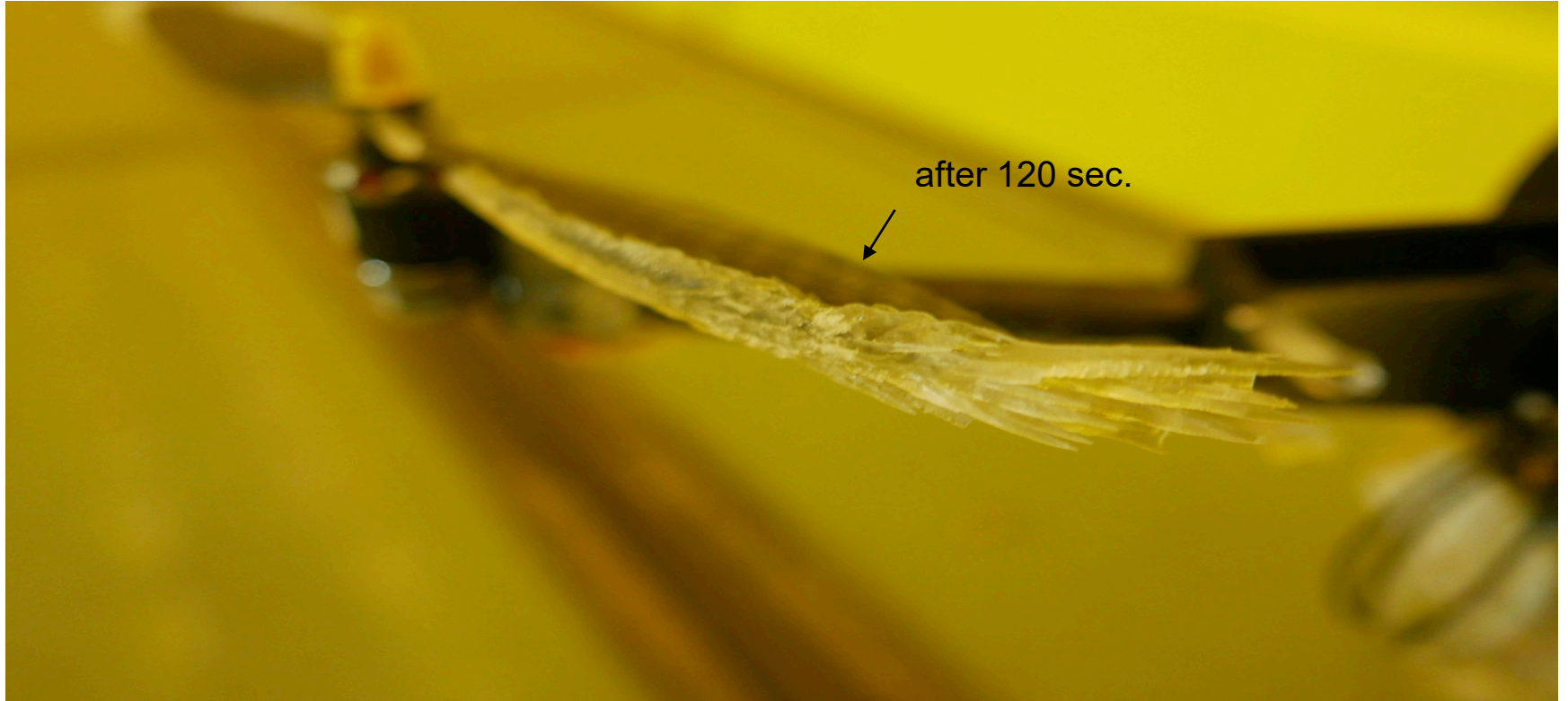
- Influence of Icing on power input
 - Power consumption increases while ice is aggregating.



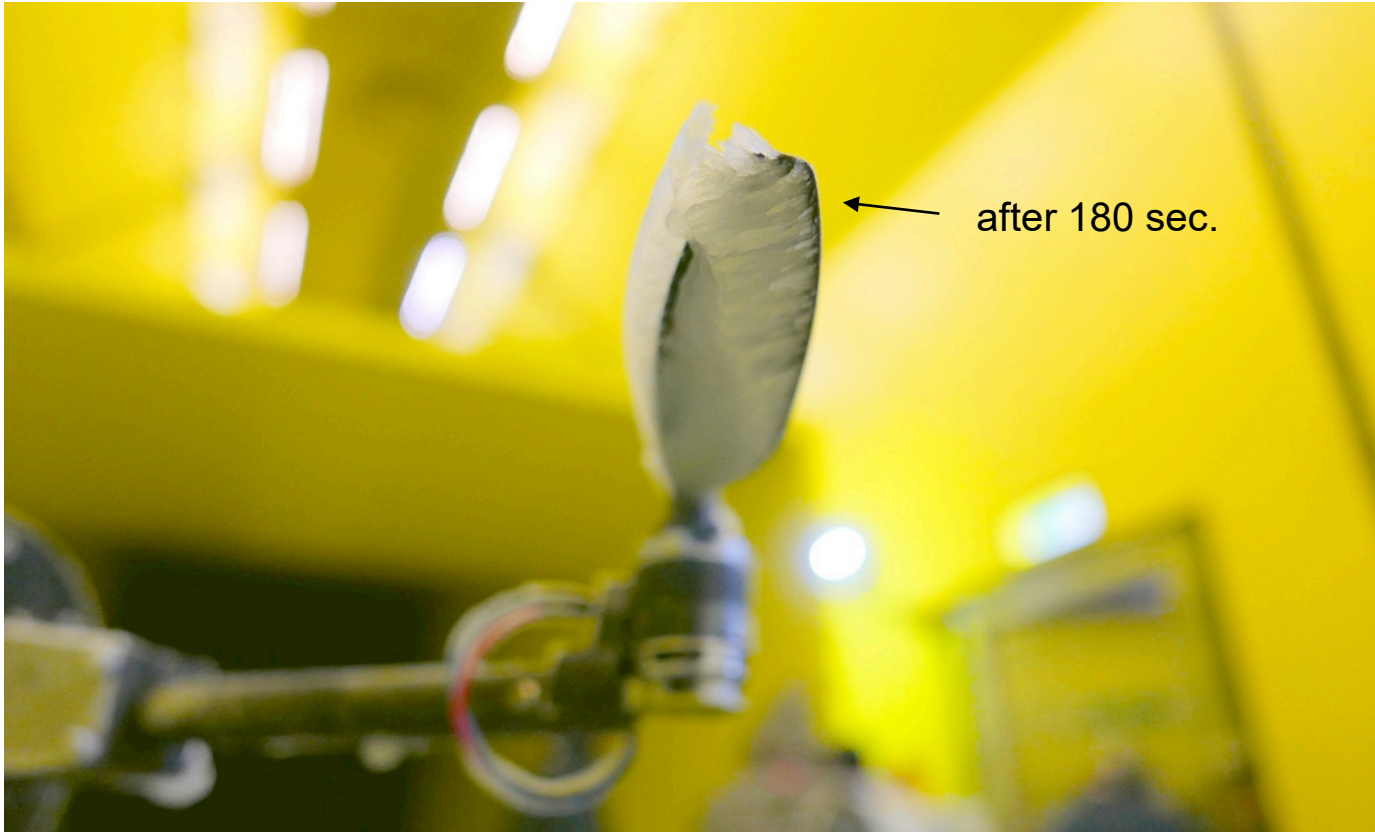
Clear ice (-2°C, MVD=20μm, LWC=0.6g/m³)



Extreme clear ice amount (-5°C, MVD=30μm, LWC=1.25g/m³)



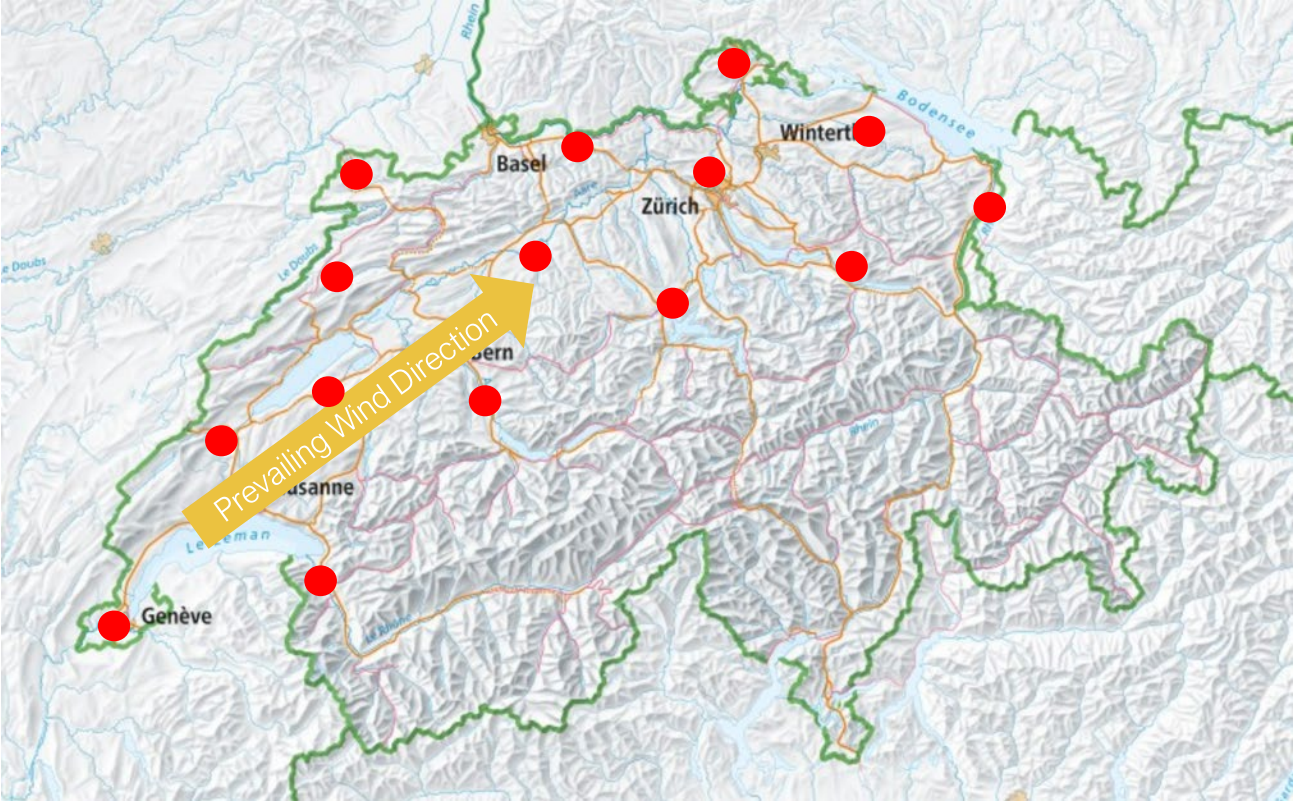
Icing at the downside of the propeller (-10°C, MVD=25μm, LWC=1.4g/m³)



Icing Test – Propeller heating

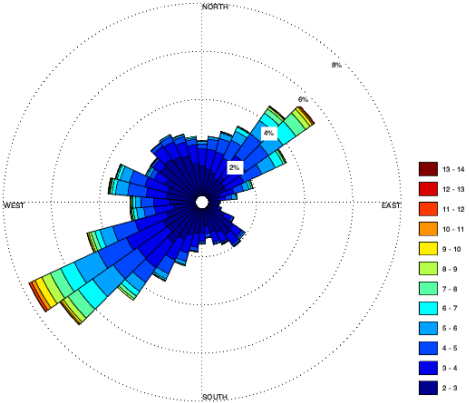


DETAf 2.0 Proposed Setup



● MeteoBase

→ Improving weather forecasts across Switzerland



Wind Speed > 2 m/s

Contact Us



Your Contact

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