

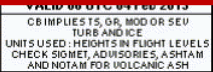


Future Information Systems on weather hazards for safe operations

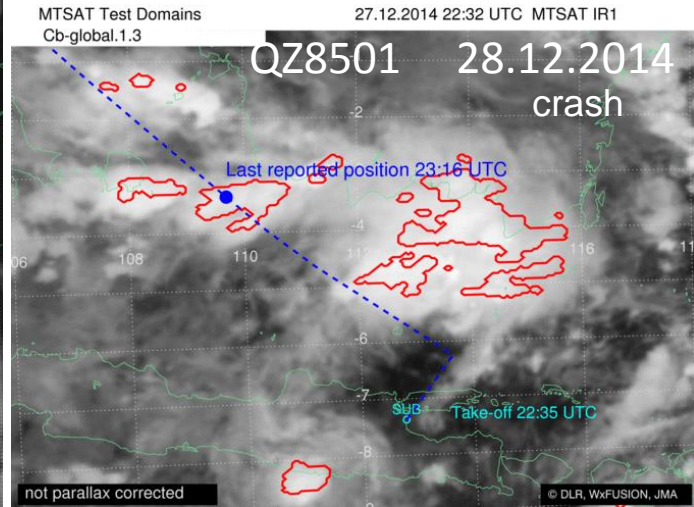
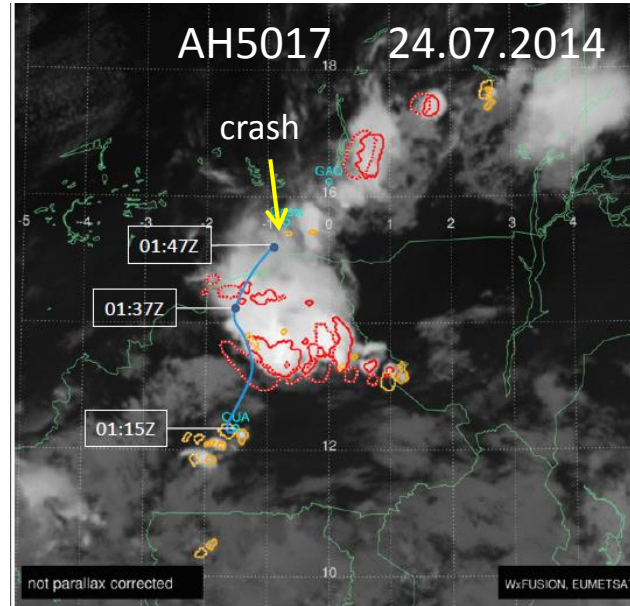
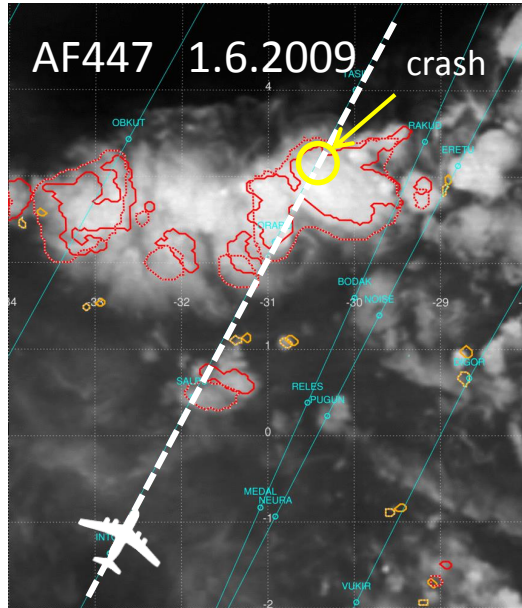
A. Tafferner and T. Gerz



Cb activity detected+nowcast
4. Feb 2013 06 UTC

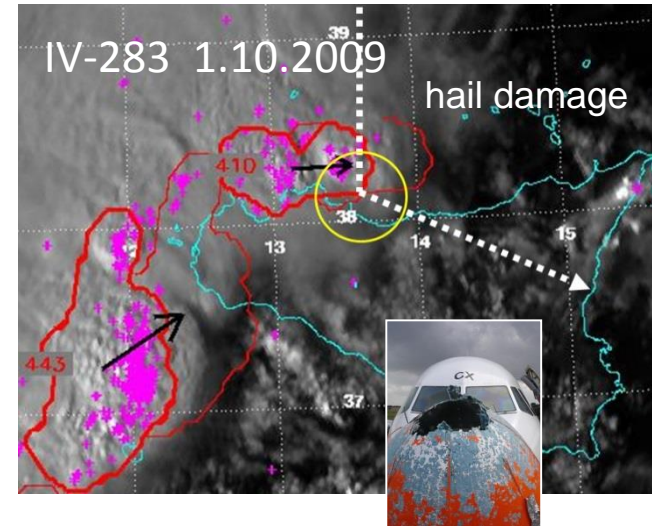
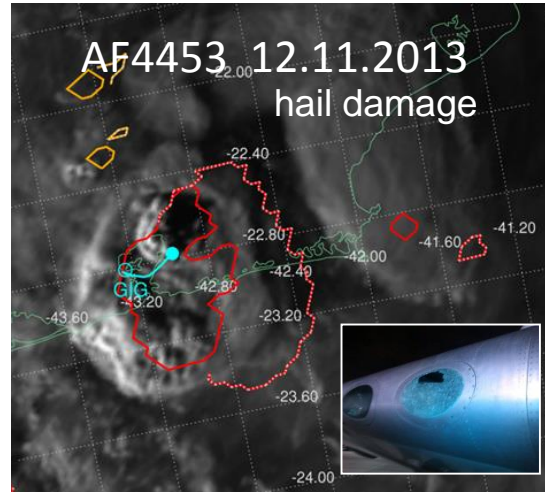
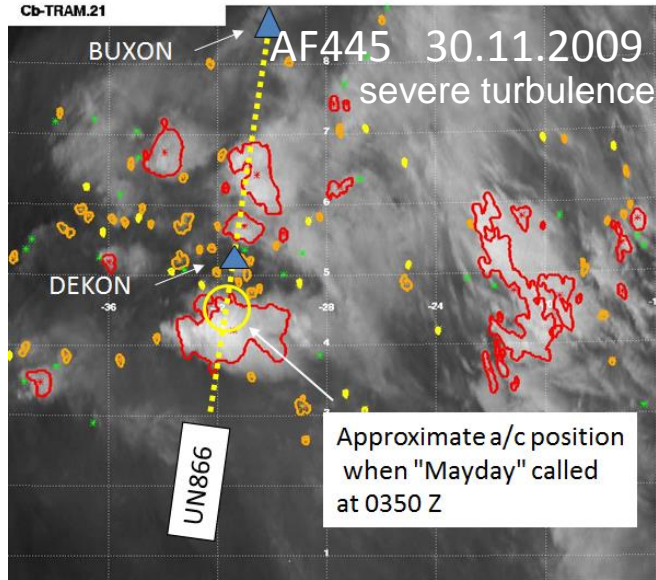


Analyses of accidents with Cb-TRAM/Cb-global



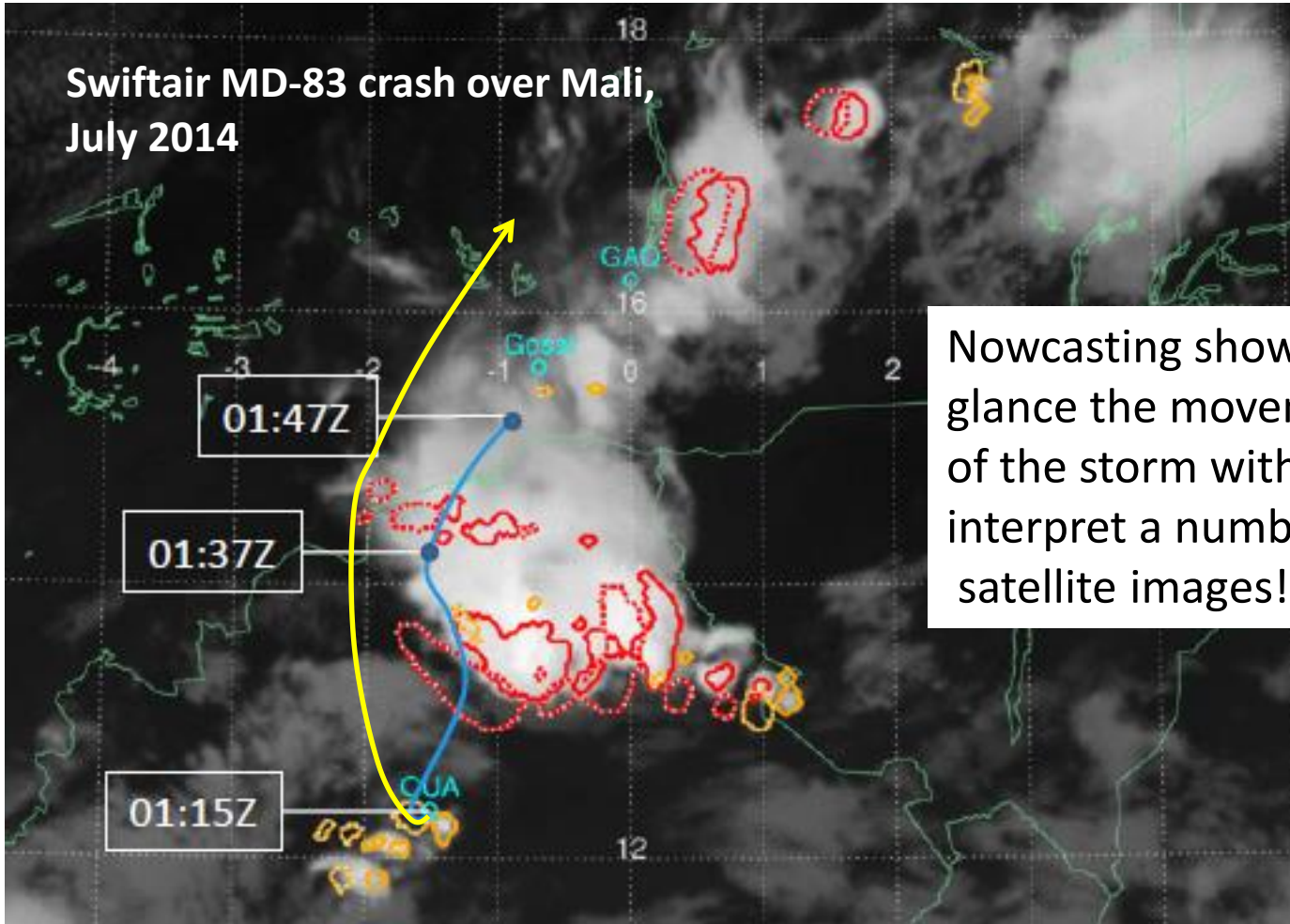
Safety! The Cb-hazard information would have been available at least 30 minutes in advance!

Analyses of incidents with Cb-TRAM/Cb-global



Safety! The Cb-hazard information would have been available at least 30 minutes in advance!

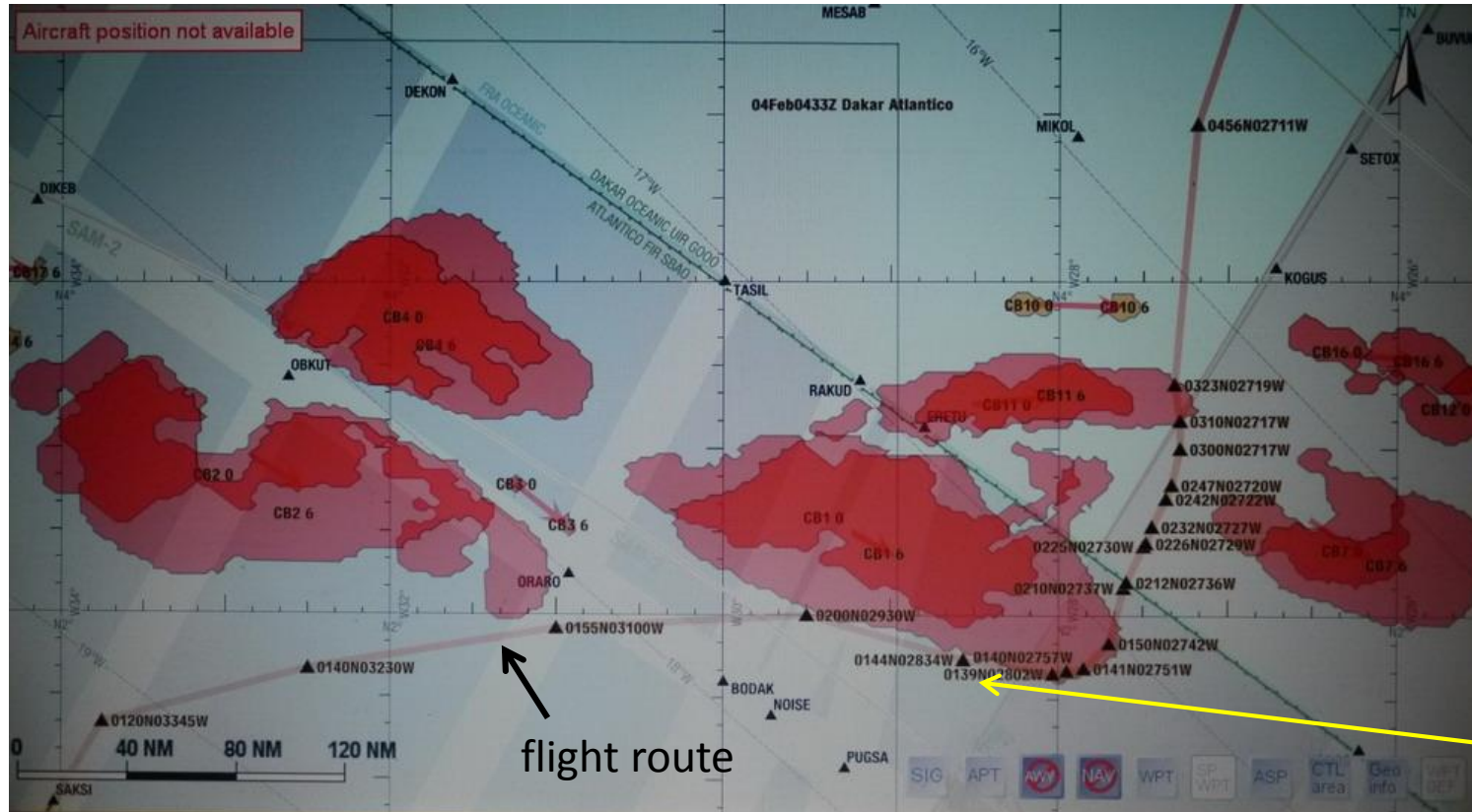
Swiftair MD-83 crash over Mali, July 2014

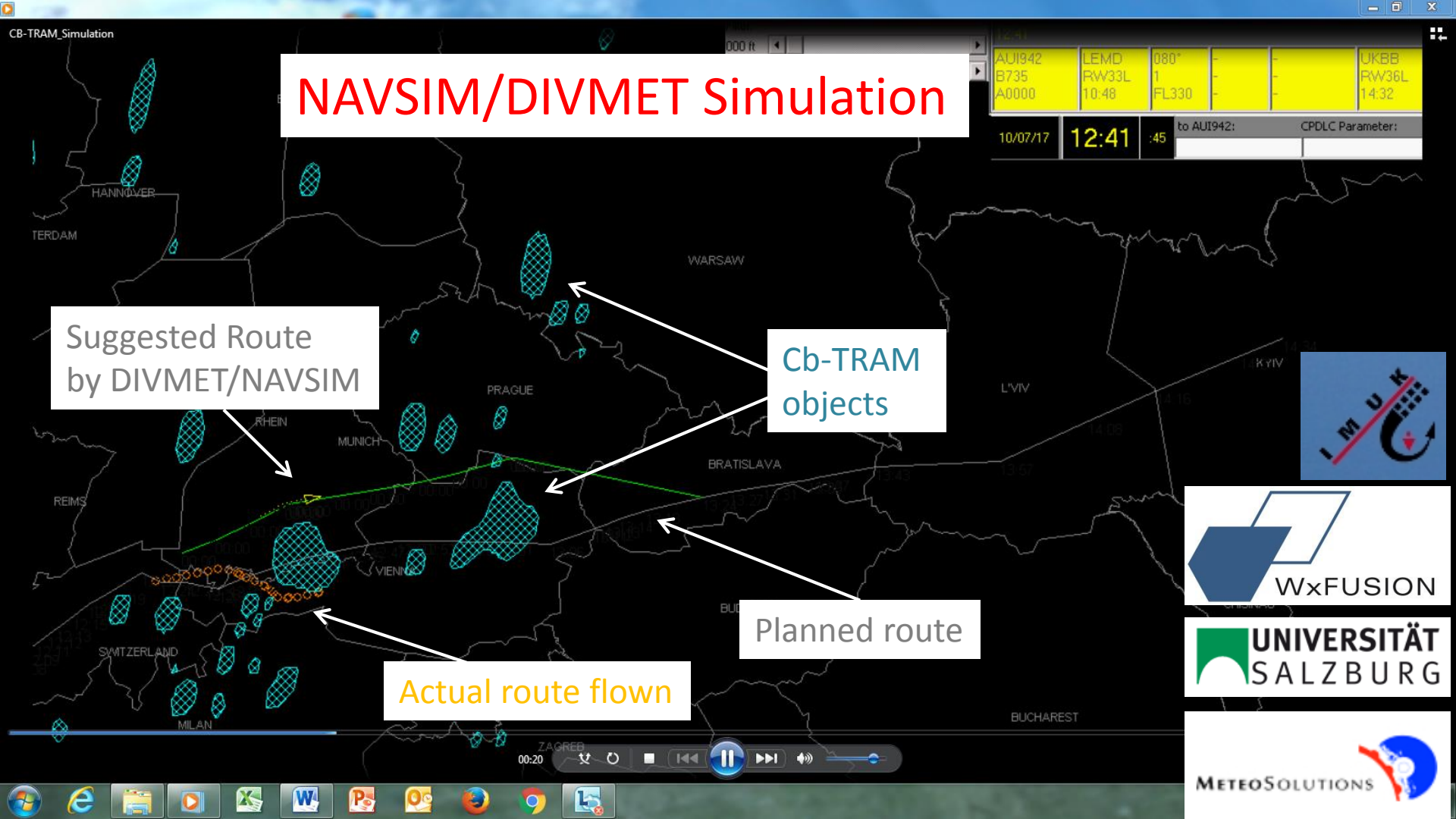


Nowcasting shows the pilot at one glance the movement and intensity of the storm without having to interpret a number of consecuting satellite images!

Test flight: Rio de Janeiro to Frankfurt, Febr 2013

A. Ritter
(Lufthansa)





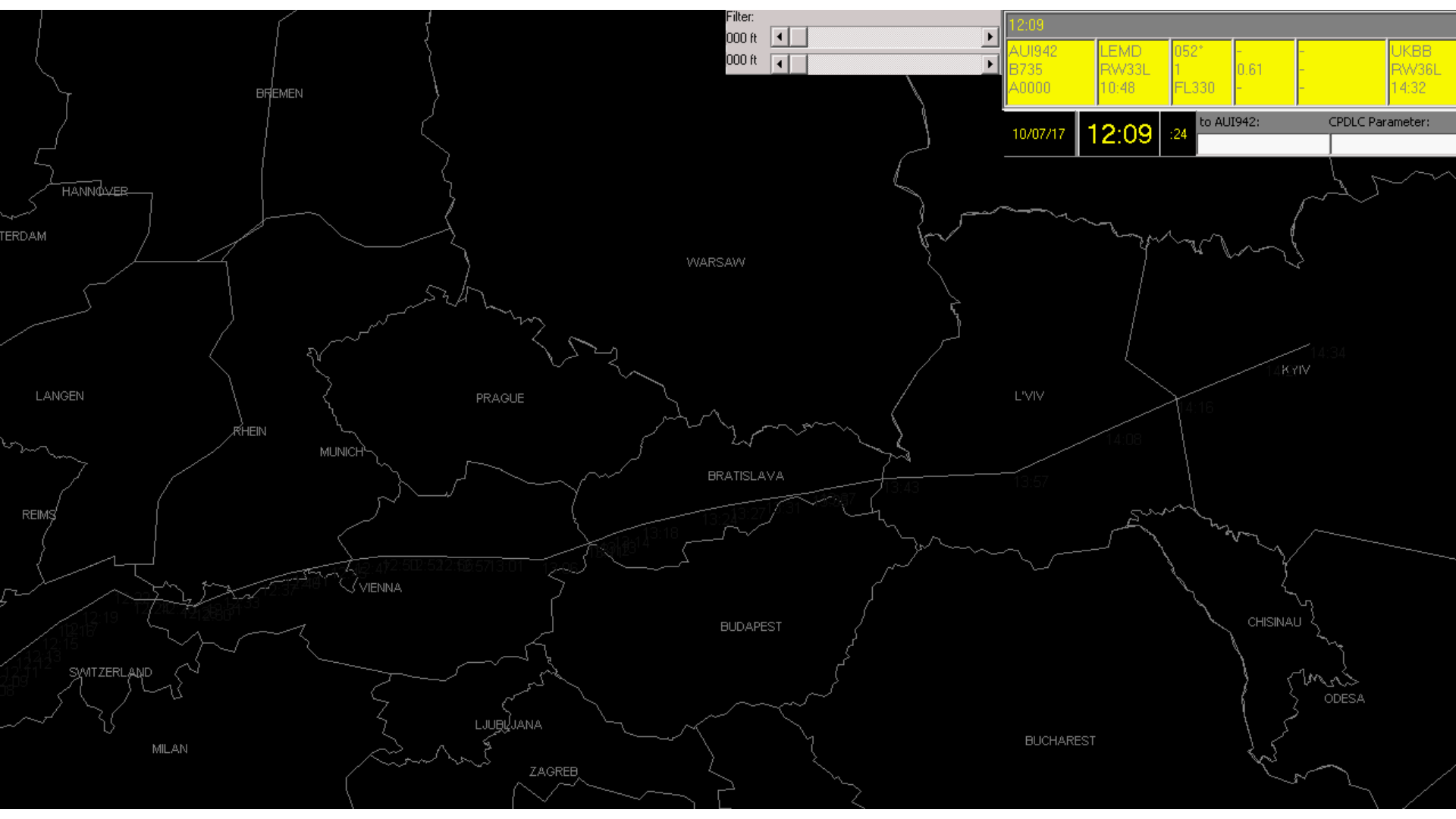
NAVSIM/DIVMET Simulation

Suggested Route
by DIVMET/NAVSIM

Cb-TRAM
objects

Planned route

Actual route flow



Filter:

000 ft

000 ft

12:09

AUI942

B735

A0000

LEMD

RW33L

10:48

052°

1

FL330

0.61

UKBB

RW36L

14:32

10/07/17

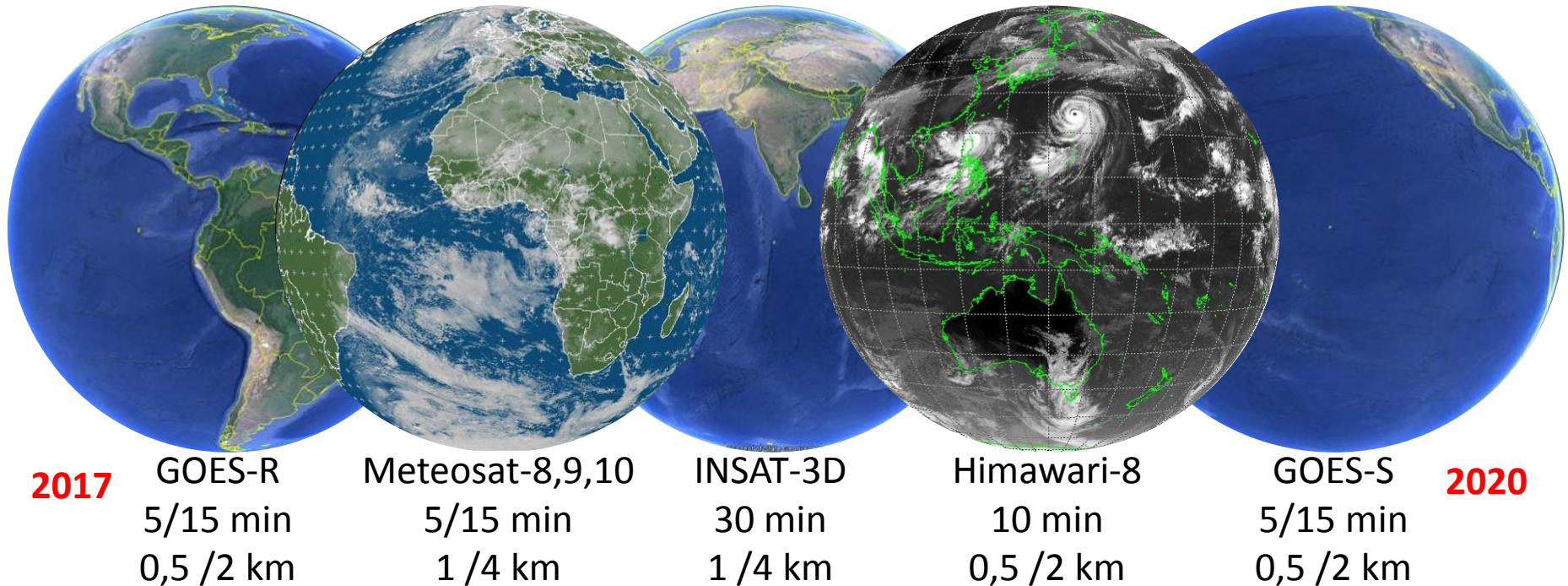
12:09

:24

to AUI942:

CPDLC Parameter:

Cb-global „seamless“



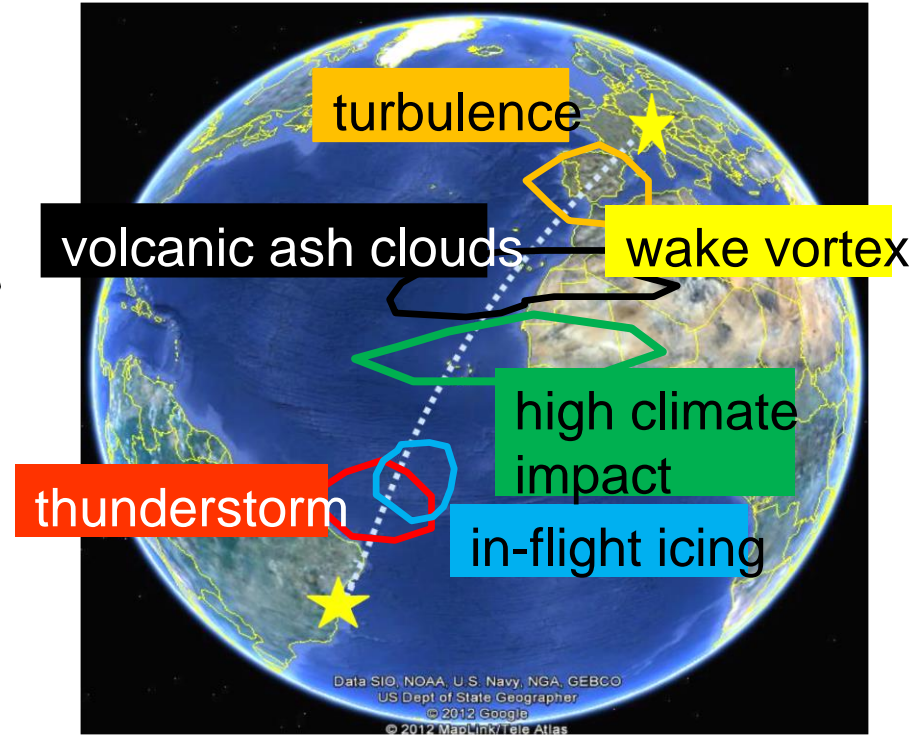
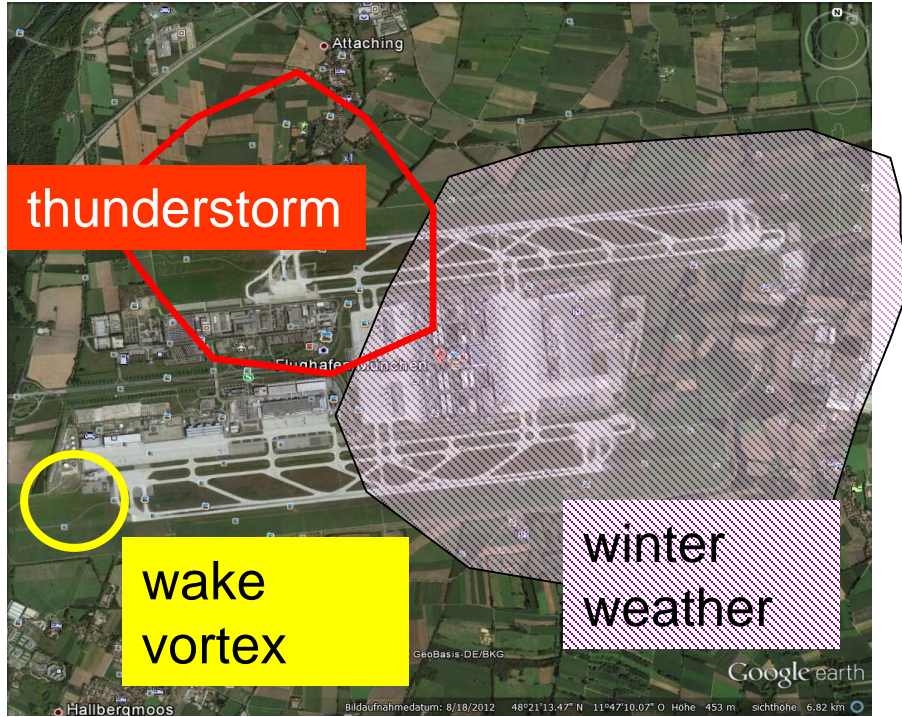
Deficiencies

- Pilots have access to weather charts only before take-off
- No update during flight
- Severe weather hazards have short time scales
- Weather forecasts from numerical models are outdated when used
- Numerical model forecasts of severe hazards like thunderstorms, turbulence, icing, are inaccurate and provide only a rough estimate of the phenomenon
- The on-board radar has limited reach and cannot see „behind“ (radar shadow)
- At cruise level on-board radar might not see the storm (ice crystals only)

Options

- Remote sensing data available in near real time, some even globally
- New in real-time working nowcasting systems provide observation trends
- EFB and data link available
- Concept of hazard objects applicable also for icing, volcanic ash, climate cost effect, ...
→ 5D Met advisory

5 D-Met Advisory



Challenges



MET

- Seamless, continuous, granularity, global

Human factors:

- Reduction of Wx complexity into hazard objects with attributes
- Reduction of work load is mandatory
- Training

Other

- Regulatory
- Standardisation
- Cost benefit aspects (new products not covered by en route charges)
- How to price tag safety?