



Report on tests in Lindenberg

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12th GRUAN Implementation and Coordination Meeting (ICM-12)
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Support for various projects

- Test flights PCFH (Nov 2019) – *Teresa Jorge*
- Test flights FLASH-B (Nov 2019)
- Test flights Skydew (until March 2020) – *Takuji Sugidachi*
- CFH with Ethanol cooling (TU-Dresden cooperation)

**Test flights QCLAS (Dec 2019)*

Cold Ethanol

Modifications to CFH

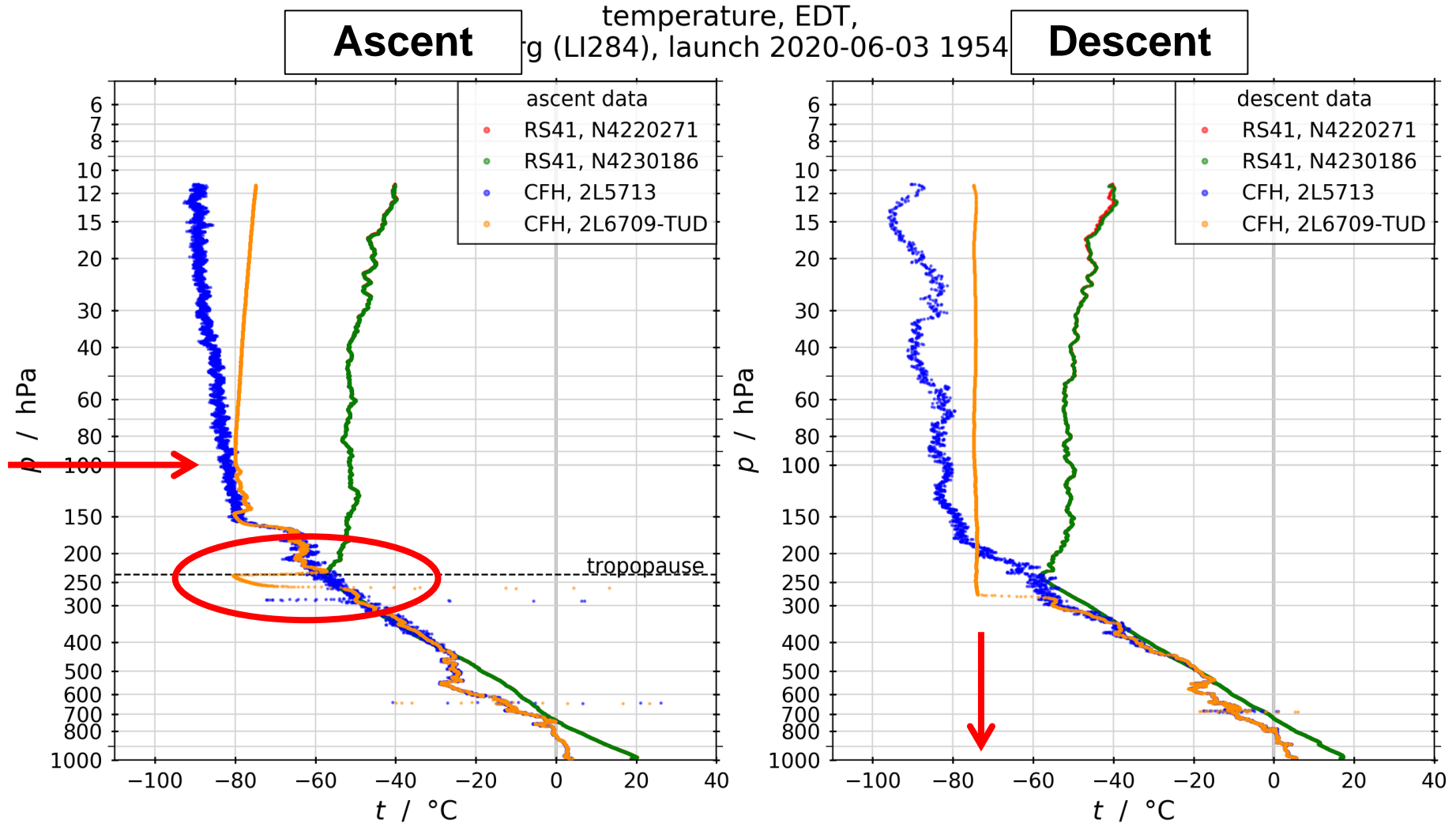
- Larger container (~700ml) to increase thermal capacity
- Mesh to increase thermal contact



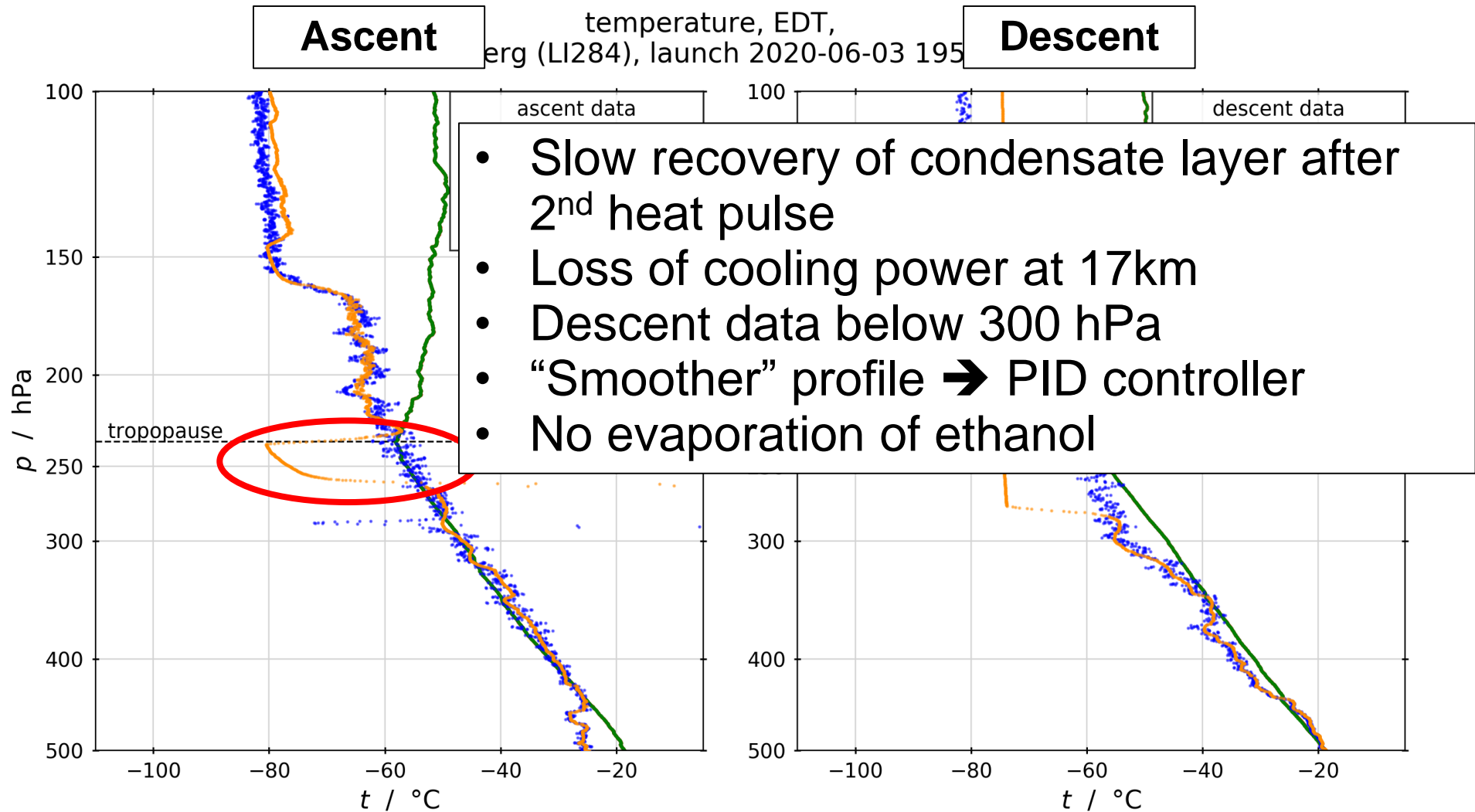
TU-Dresden cooperation

- Test flight 3 June 2020
- $T_{\text{ethanol}} = -113.5\text{C}$ (freezing point)
- Liquid/Ice mixture
- CFH_{R23} & $\text{CFH}_{\text{Ethanol}}$



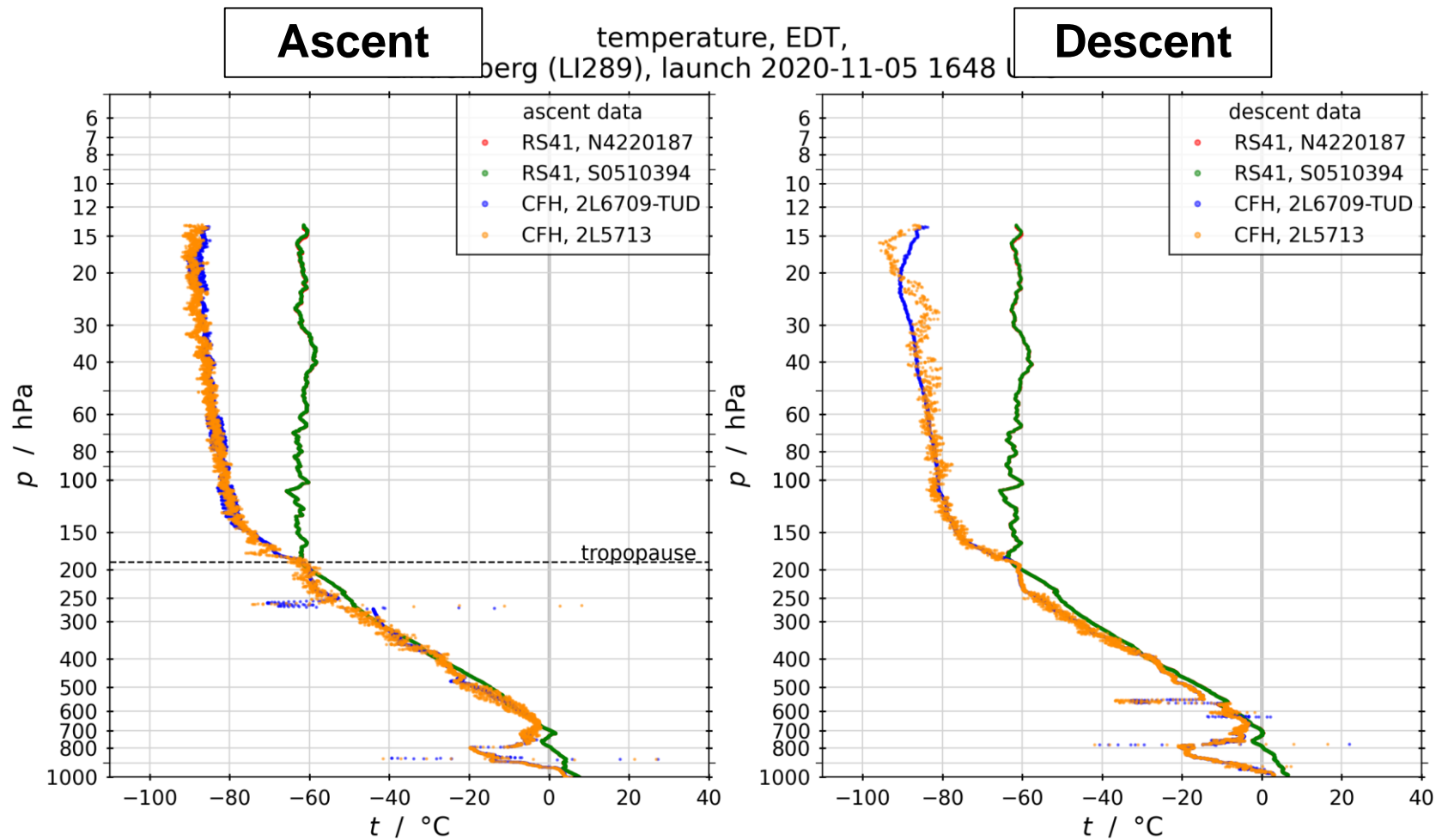


Lindenberg – 2020-6-3

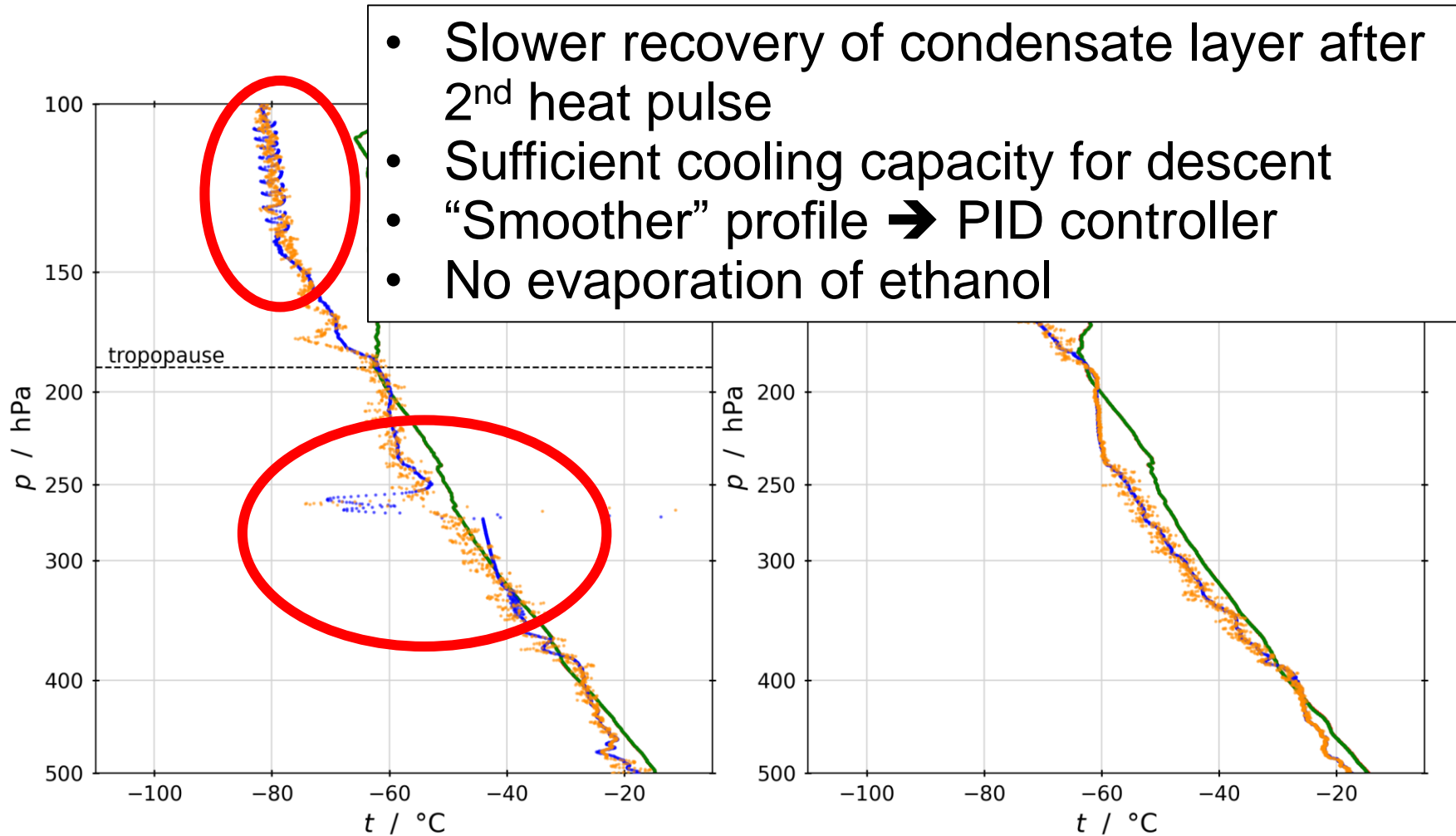


Lindenberg – 2020-6-3

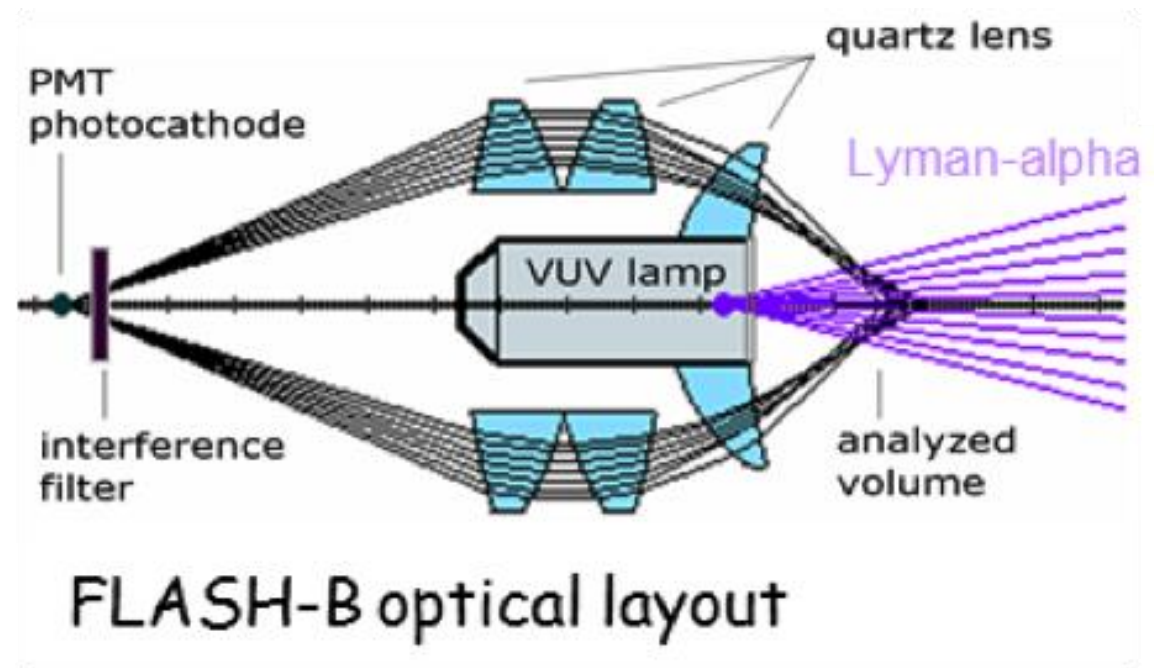
Ethanol/Dry ice



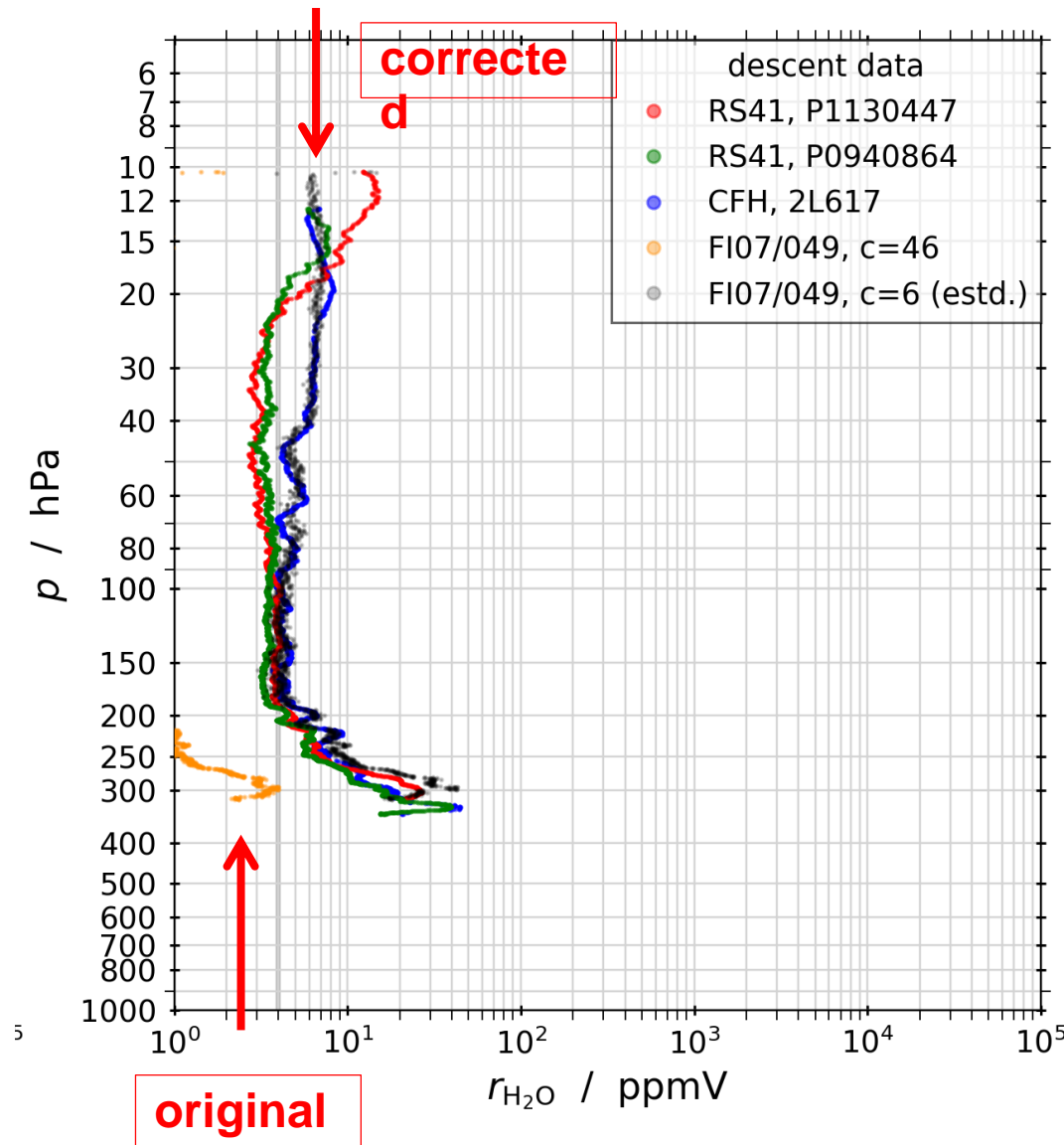
Lindenberg – 2020-11-5



- Fast response time ($< 1\text{ s}$)
- Optical detection (luminescence)
- Night time & descent only
- Alt $> 7\text{ km}$
- **Calibration issues**

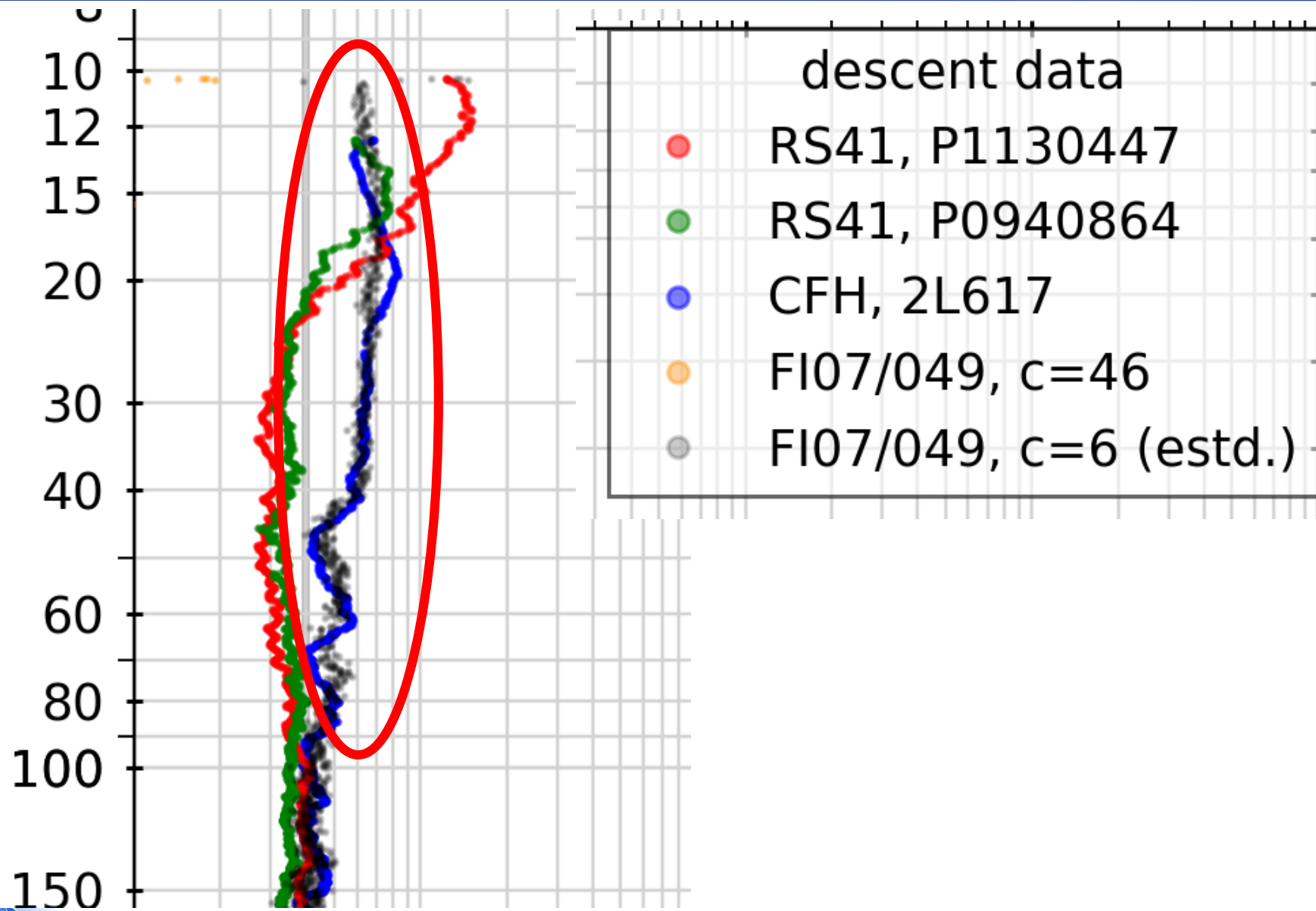


Presentations A. Lykov (ICM-9/10)



- Initial calibration incorrect
- Correction factor ~ 7.5
- After correction: good quantitative & qualitative agreement with CFH

Ny Alesund, 21-2-2020



- Ethanol/dry ice
 - Sufficient thermal capacity for ascent + descent
- Results similar to R23-cooled CFH
- Slower recovery of condensate layer
 - Ethanol: less cooling power
- PID controller optimized for R23
 - Smoother profile
- Modifications to CFH needed?
 - Thermal conductivity
- Involvement Ensci
 - Holger Vömel