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IAGOS – CARIBIC

new payload & move to a Lufthansa Airbus A350



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scientific institutions



industry





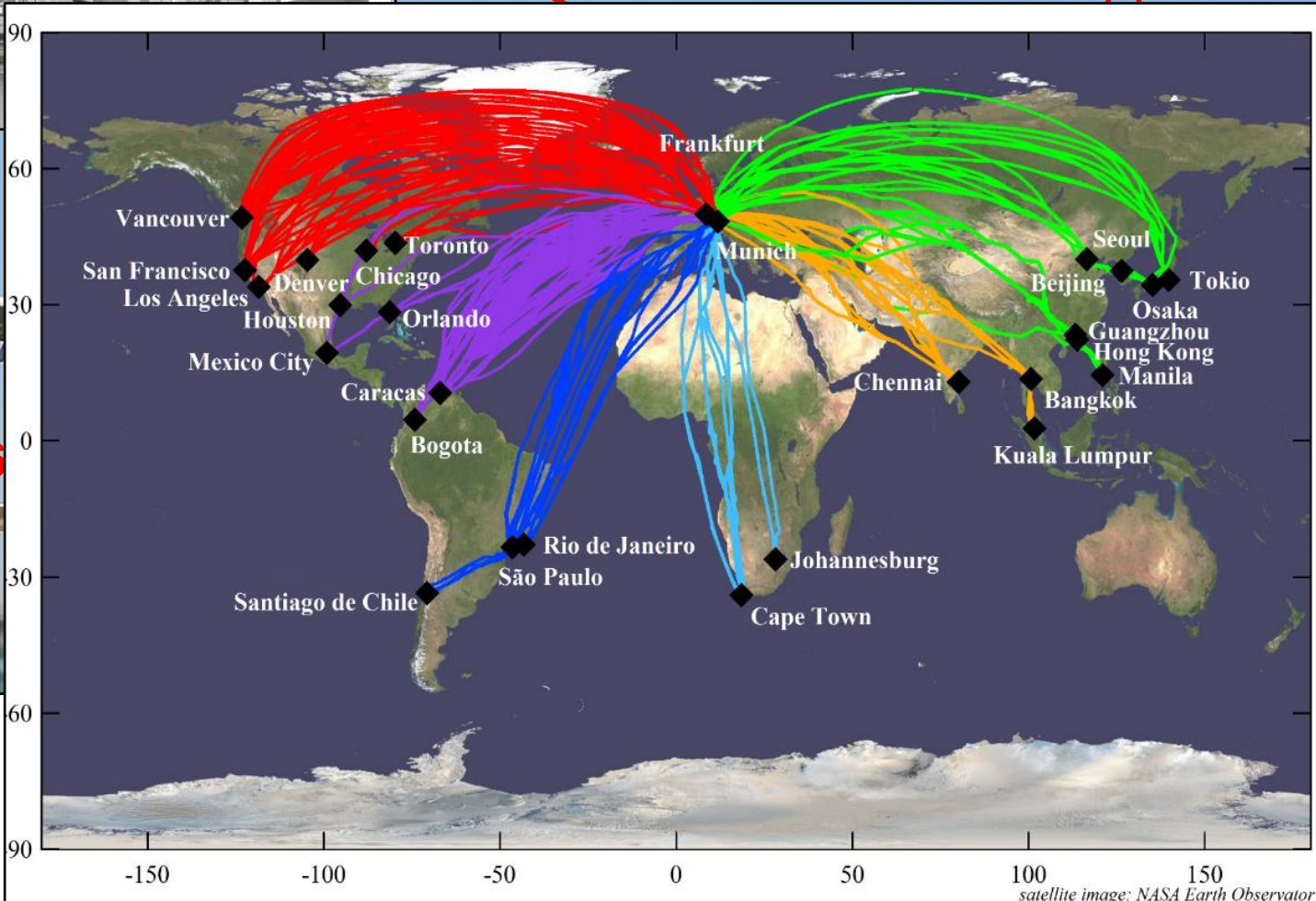
2. CARIBIC laboratory

4. power & control logic
5. ARINC aircraft data

6. Cockpit
7. Security (Smoke)



Lufthansa
Airbus A340-6

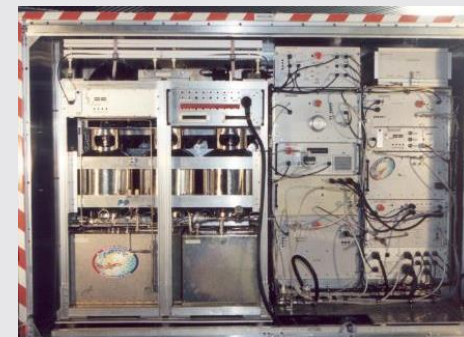


IAGOS-CARIBIC payload: a historical run

CARIBIC I (LTU airlines, Boeing 767-300 ER, LD4 container)

1997 – 2002 75 flights (à 10 h) **6 instruments**

In-situ:	O ₃ , CO, aerosol (conc.), NO/NO _y (year 2000)
Air sampler (20):	CO ₂ , CH ₄ , N ₂ O, SF ₆ , NMHCs, HCs, isotopologues (of CO, CO ₂ , H ₂)
Aerosol sampler:	aerosol elemental composition (Si, S, K, Ca, Ti, Mn, Fe, Ni, Cu, Zn)



CARIBIC II (Lufthansa, Airbus A340-600, LD11 container)

2005 – 2009 282 flights **10 instruments**

In-situ:	H ₂ O (vapor, cloud), O ₃ , CO ₂ , CO, NO, NO _y , VOCs, Hg, aerosol
Air sampler (28):	CO ₂ , CH ₄ , N ₂ O, SF ₆ , NMHCs, HCs, (isotopologues of CO ₂)
Aerosol sampler (16):	aerosol elemental composition

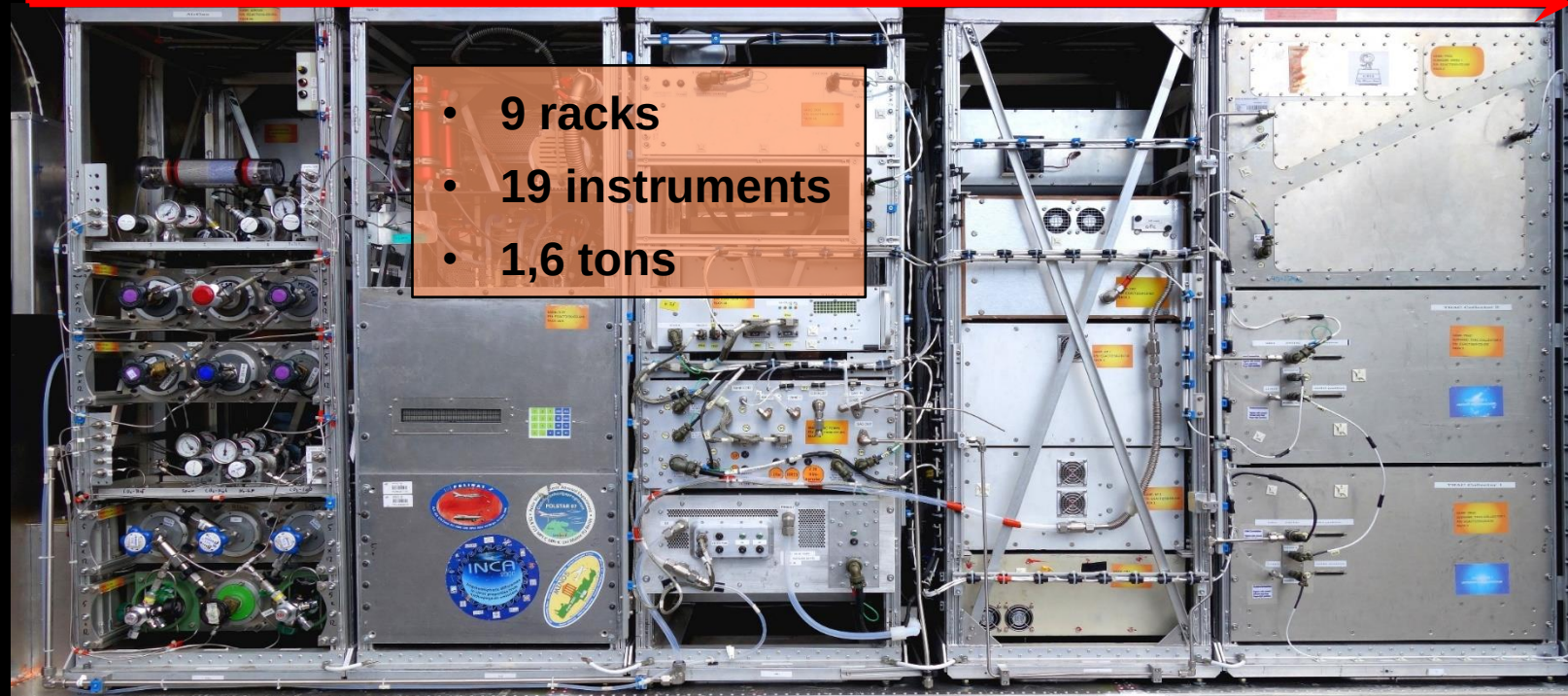
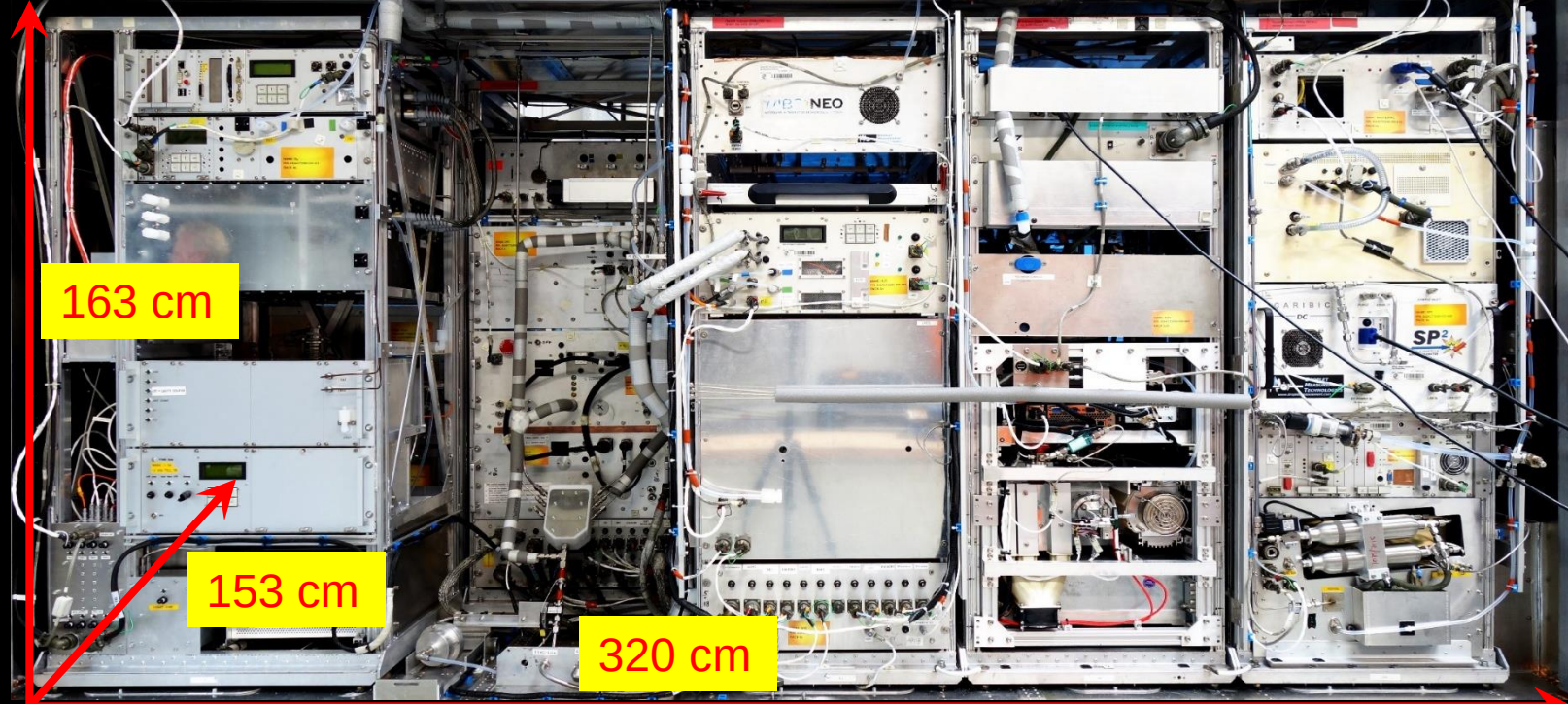
Since 2010 243 flights **14 instruments**

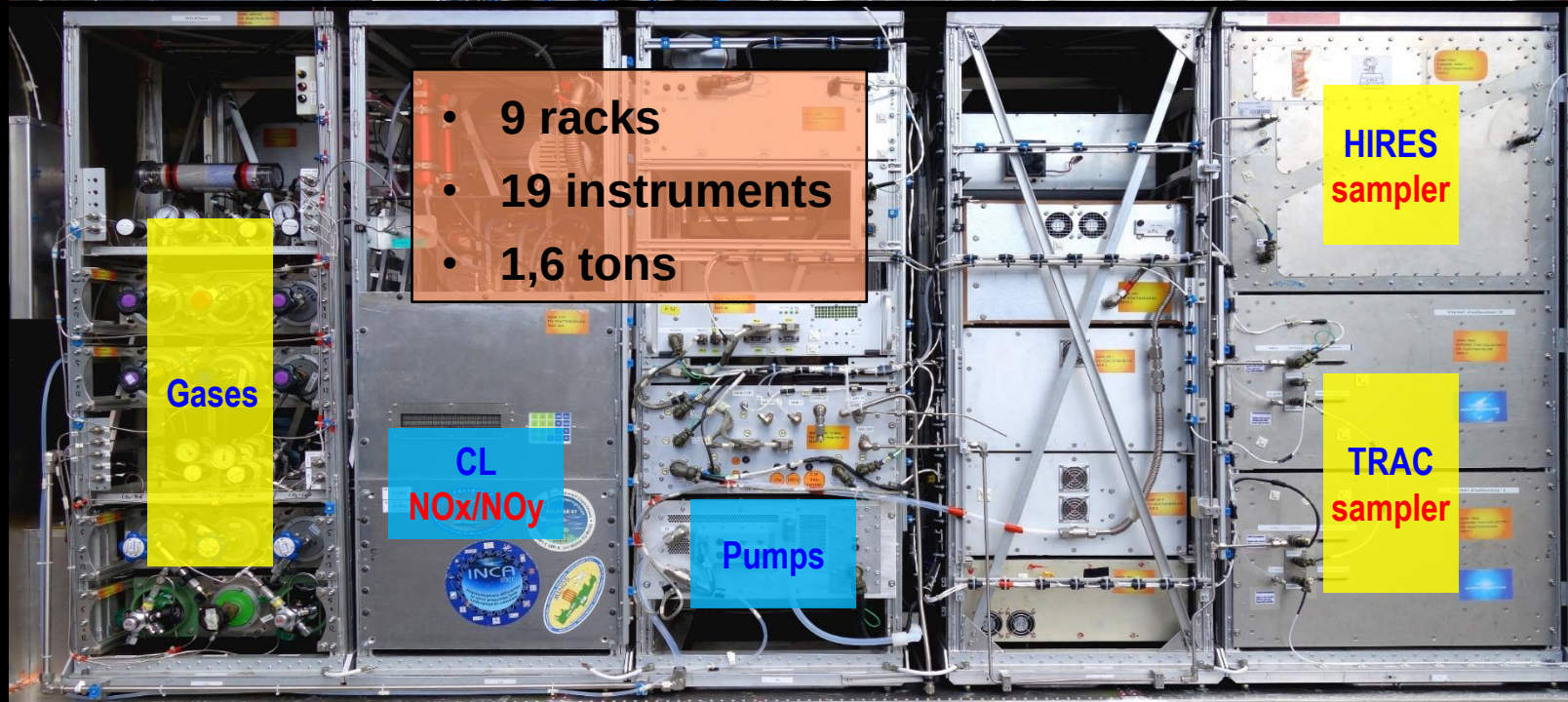
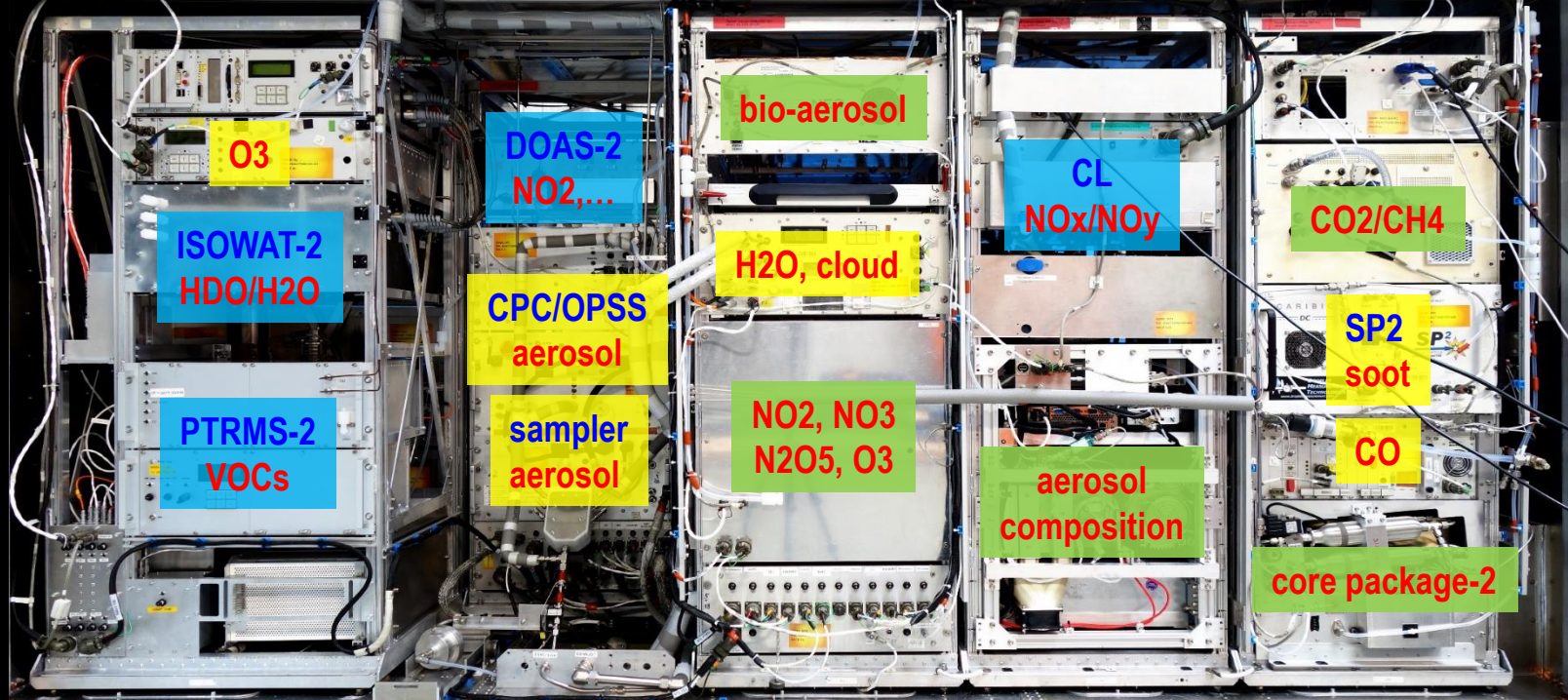
In-situ:	+ H ₂ O (D/H), CH ₄ , NO ₂ , aerosol (size), soot (since 2015)
Air sampler (28+88)	

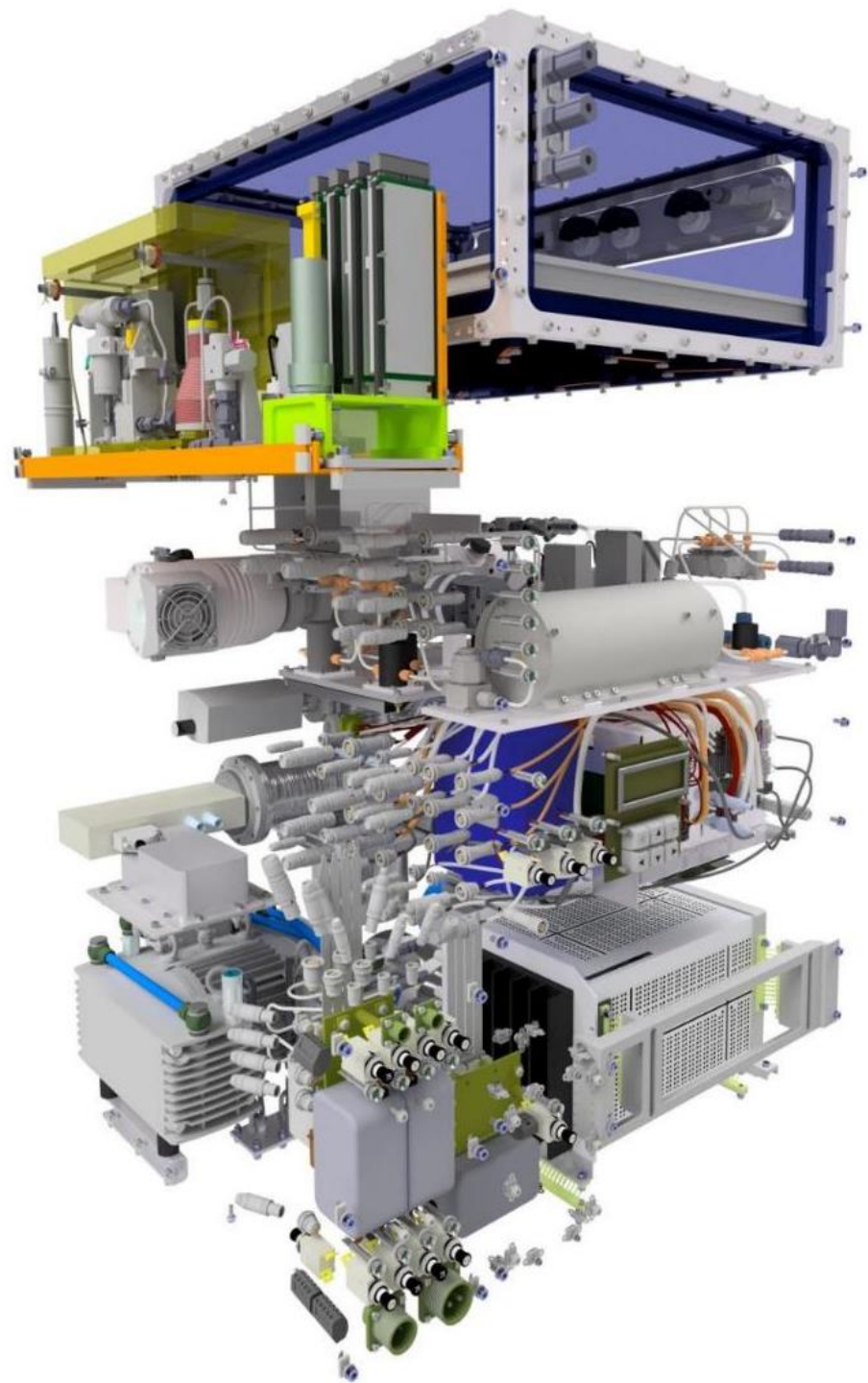
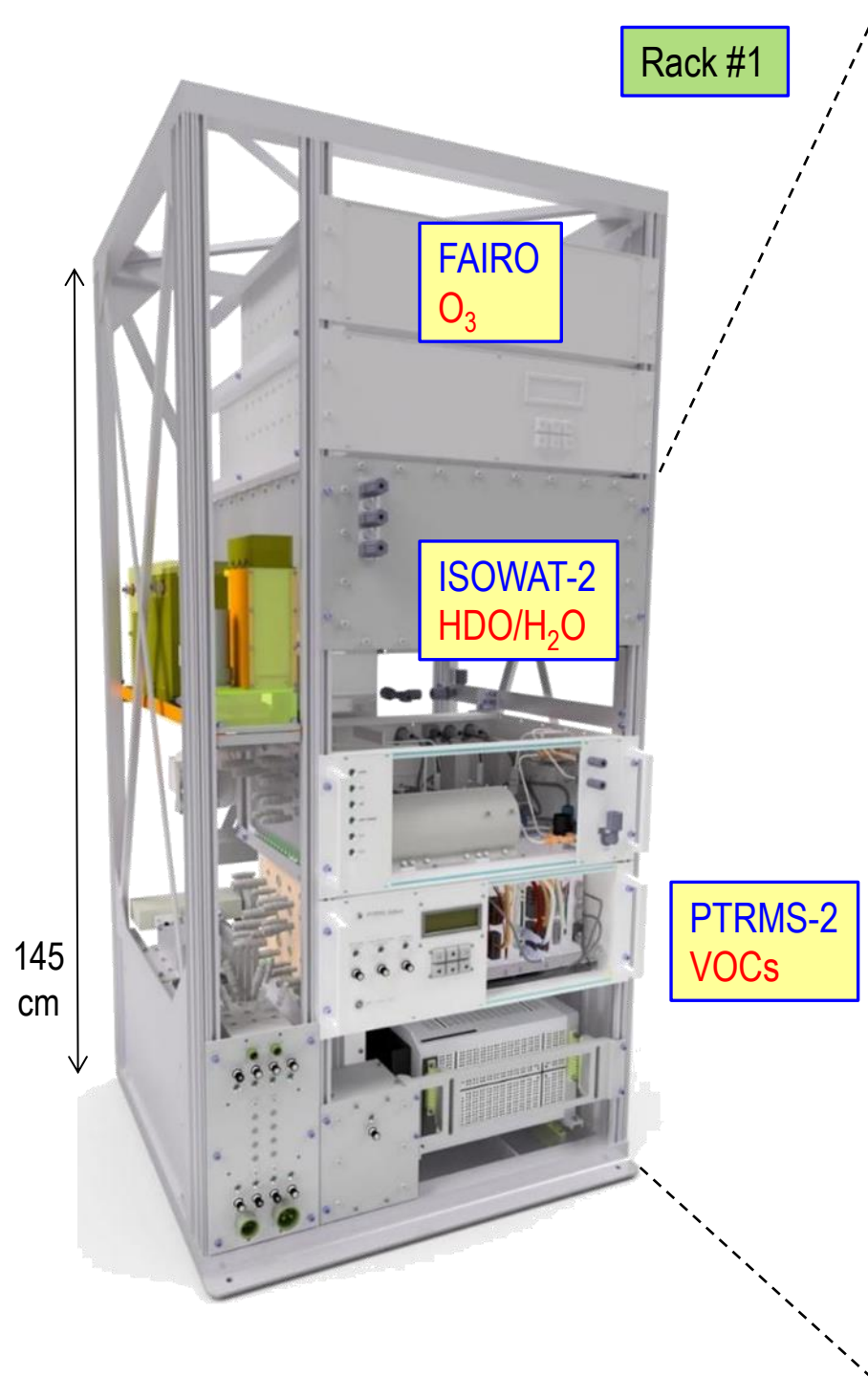


2016/2017 **19 instruments**

New / modified instruments, new container







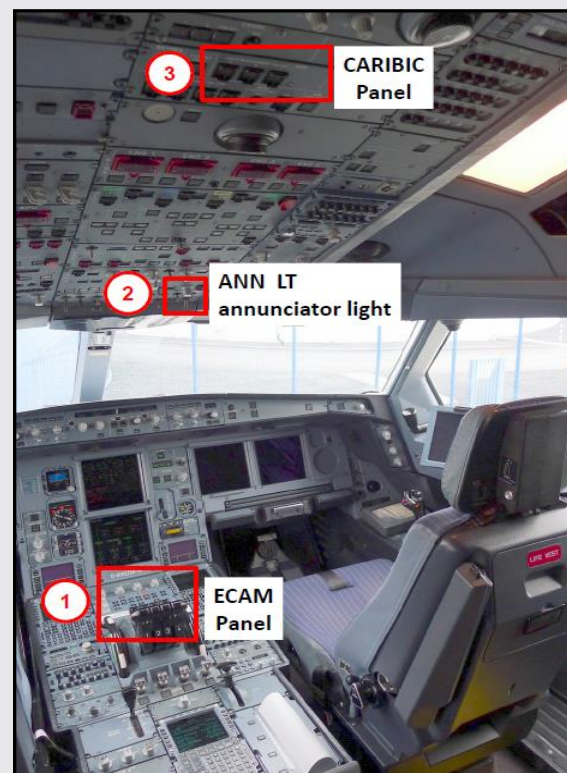
CARIBIC II (Mod-C, 2016/2017)

19 instruments

- In-situ:** H₂O (vapor, cloud), O₃, CO, CO₂, CH₄, NO, NO_y, NO₂, NO₃, N₂O₅, ~5 VOCs
aerosol (concentration, size distribution, composition, soot, funghi, bacteria,...)
core package-2 slot
- Air sampler (116):** CO₂, CH₄, N₂O, SF₆, ~20 NMHCs, ~30 halocarbons, ...
- Aerosol sampler (16):** aerosol elemental composition (Si, S, K, Ca, Ti, Mn, Fe, Ni, Cu, Zn)

Certification:

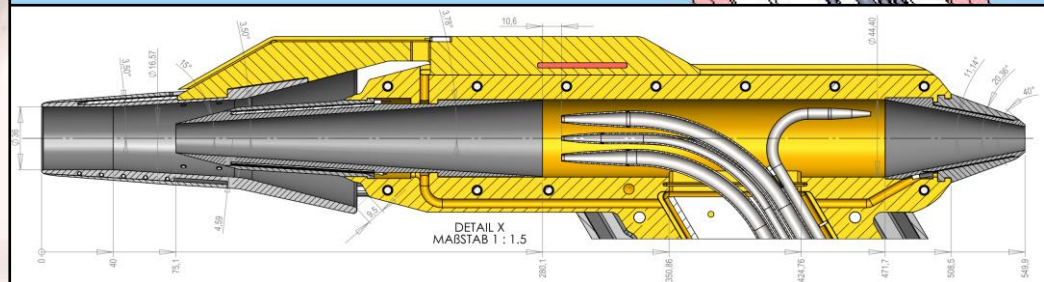
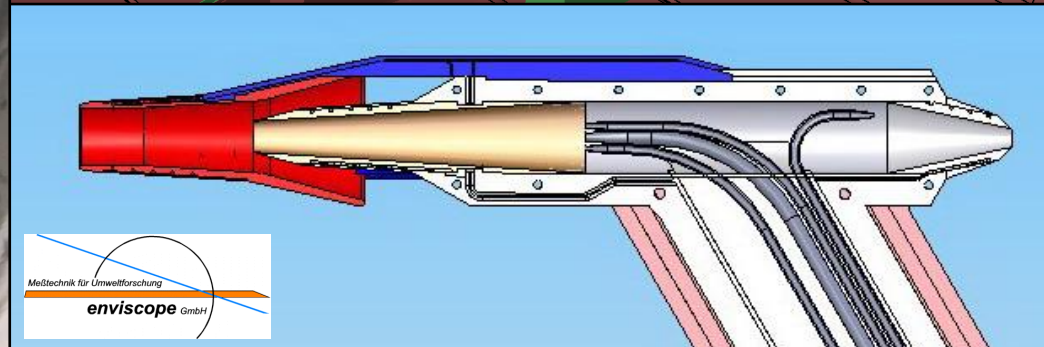
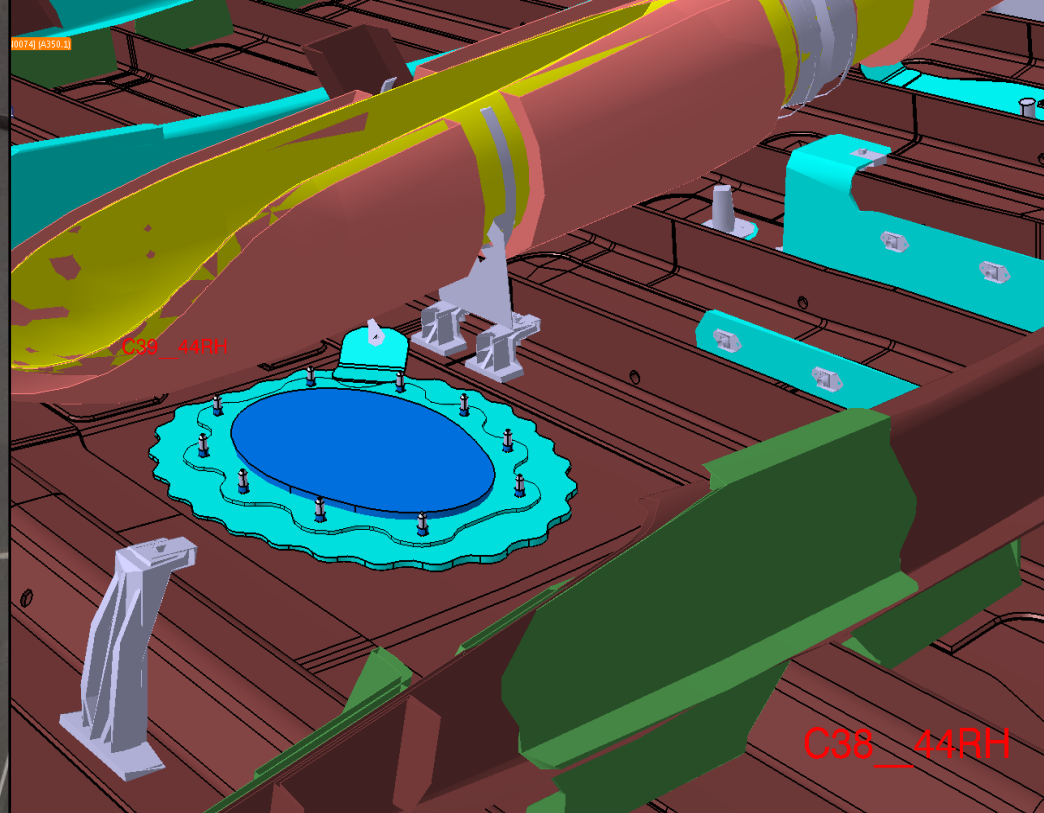
- STC, no Form1 (special certification)
- Component maintenance manual (CMM)
- ~70 check lists
- ! Dangerous goods (O₂ bottles, butanol,...)
- ! Flammable material / plastics (not UL-V0)
- ! Load analysis, mechanical integrity
- ! Smoke detection



Vision: move to Airbus A350

- Phase-out A340-600: mid-2019
- Feasibility study (FS):
 - A350: best choice





Vision: move to Airbus A350

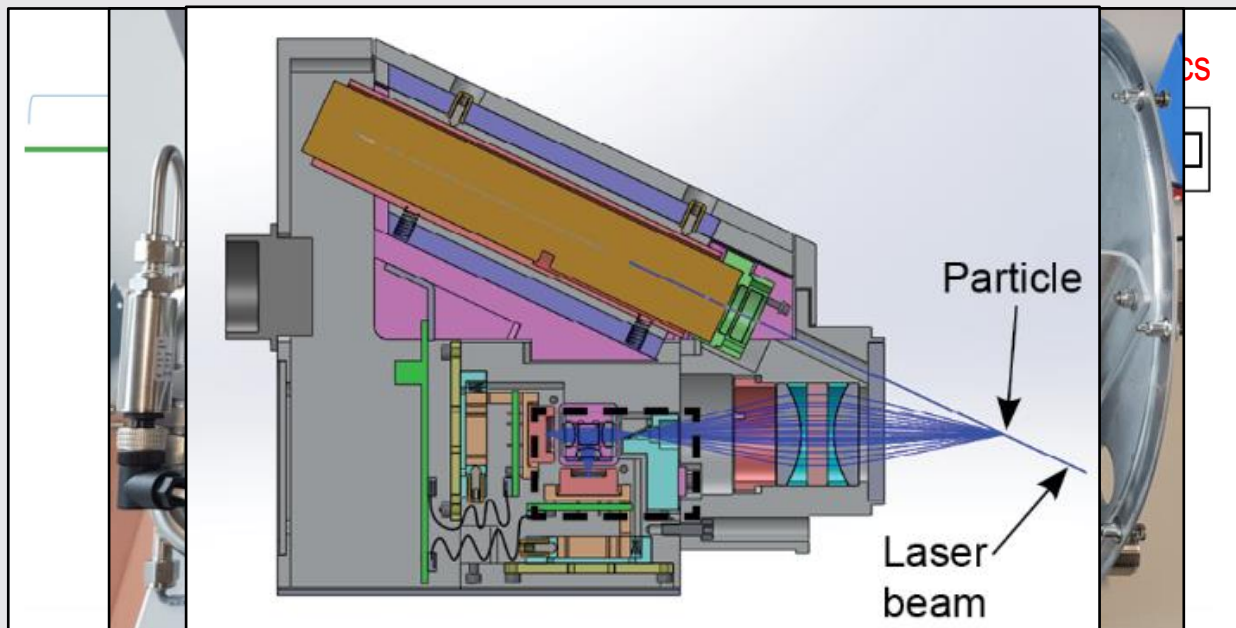
- Phase-out A340-600: mid-2019
- Feasibility study (FS):
 - A350: best choice
 - identification of certification issues: thermal concept, smoke detection,...
 - 10/2018: submission to EASA
- 2019/2020: A350 modification



Vision: new instrumentation

Cloud information:

- BCP(D) (-core)
- Simone
- IN sampler



Vision: new instrumentation

Cloud information:

- BCP(D) (-core)
- Simone
- IN sampler

Trace gases:

- VOCUS (TOF-MS)
organic compounds

... decisions pending

