High Sensitivity Proton-Transfer-Reaction Mass Spectrometer (HS PTR-MS) (Wisthaler, Hansel)

- detects VOCs (except alkanes and small alkenes)
- sequential measurement: temporal/spatial resolution vs. number of measured species
- select compounds to be measured according to science question for specific flight (segment)

COMPOUND	STATUS	INTEGRATION TIME	COMMENT
methanol	routine	1 sec	
acetone	routine	1 sec	propanal, glyoxal interference (<< acetone)
acetonitrile	routine	1-2 sec	$\Delta CH_3CN/\Delta CO$!!
acetaldehyde	routine	2-5 sec	ozone artifact, detection limit (low tens of ppt)
benzene	routine	1-2 sec	detection limit (low tens of ppt)
toluene	routine	1-2 sec	detection limit (low tens of ppt)
acetic acid	exploratory	1-2 sec	promising results (NOAA P-3)
formaldehyde	exploratory	5 sec	promising results (ACCENT), try intercomparison flight (segment)
PAN	exploratory	5-10 sec	long integration time, different operation mode, additional thermal scrubber, redundant (PAN cigar); intercomparison ?
peracetic acid	highly exploratory	5-10 sec	long integration time, different operation mode, additional thermal scrubber, redundant (Caltech CIMS); intercomparison ?

HS PTR-MS: operation requirements

- TEMPERATURE
  - flight operation: 20-25°C
  - over night: T > 5°C ; preferably T > 15°C
- CONTAMINATION
  - no open solvents (methanol, acetone, acetonitrile) in the cabin; sealed vessels !!
  - instrument exhausts ? (organics, sulfur)
  - de-iceing ?
  - any other organic contaminants except engine exhaust ?
- POWER
  - power-up: > 2 h; ideally overnight before flight (ext. power cord ?)
  - power-down: > 30 mins
- INLET
  - heated inlet (Adam ?)
  - inlet cover