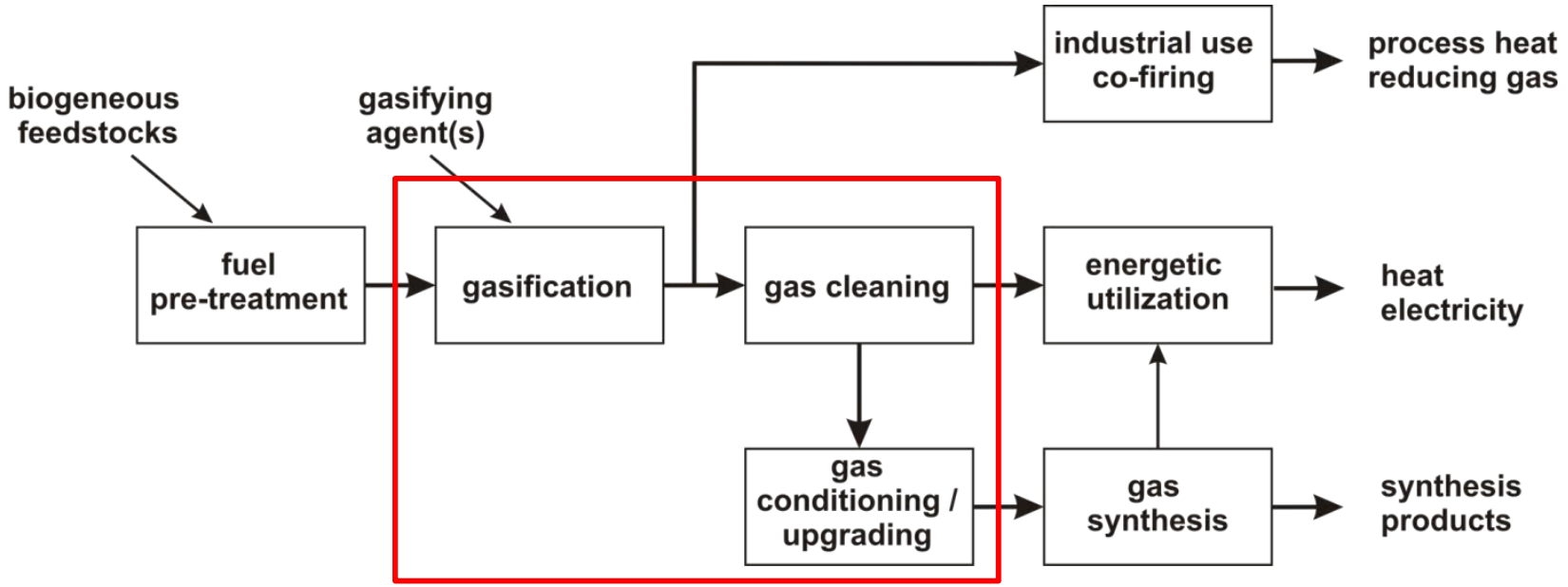
Technische Universität Berlin

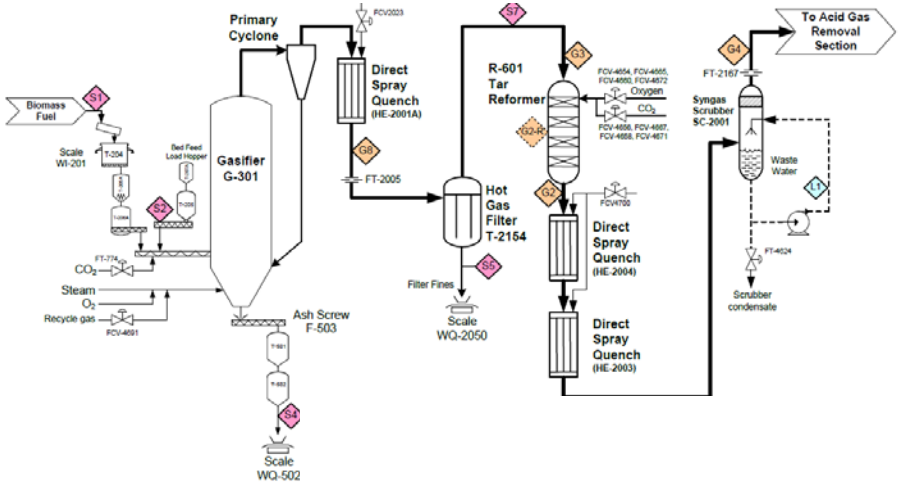
Questions regarding tar and especially on-line tar measurement and monitoring

York Neubauer | institute of energy engineering | NWG-TCKON | Vienna 05.06.2015

EVUR

Thermochemical Gasification





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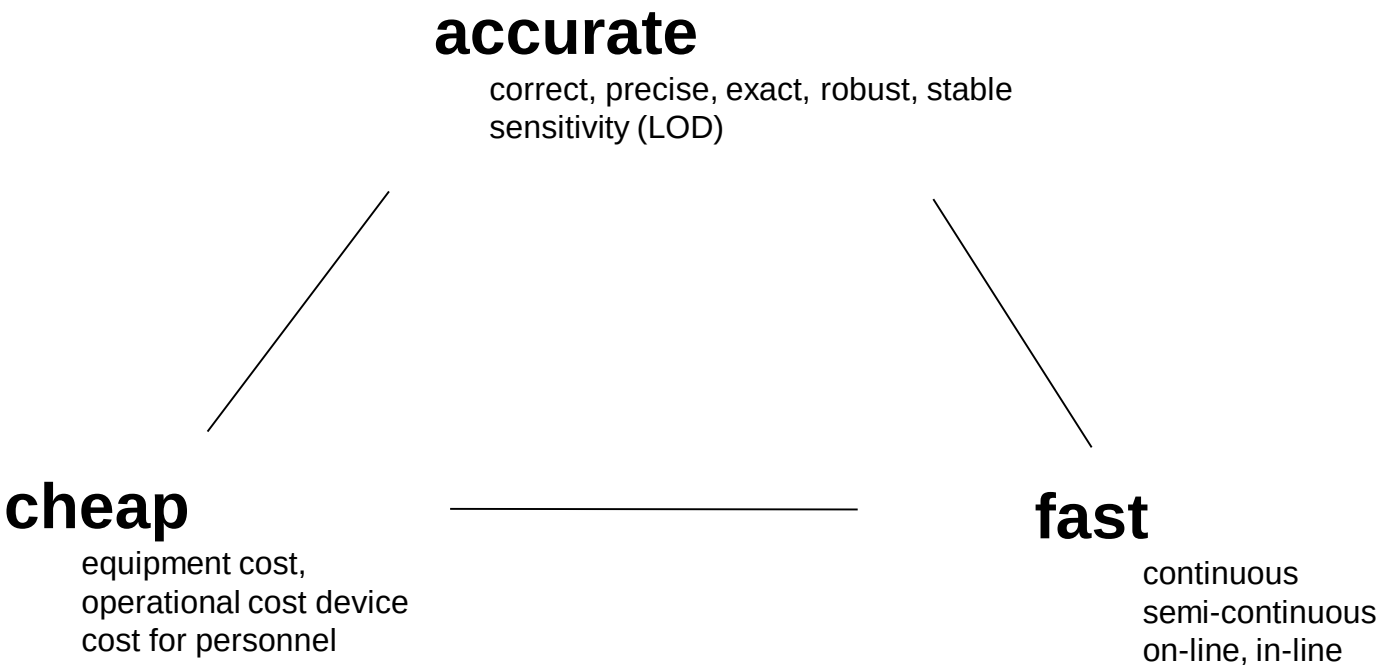
On-line Tar measurements – the main questions

- What do we need to know?
  - ‚Tar' - Monitoring
  - Monitoring of individual species e.g. benzene, naphthalene
  - Limit control??
- What would we like to know?
- How much detail is really needed?

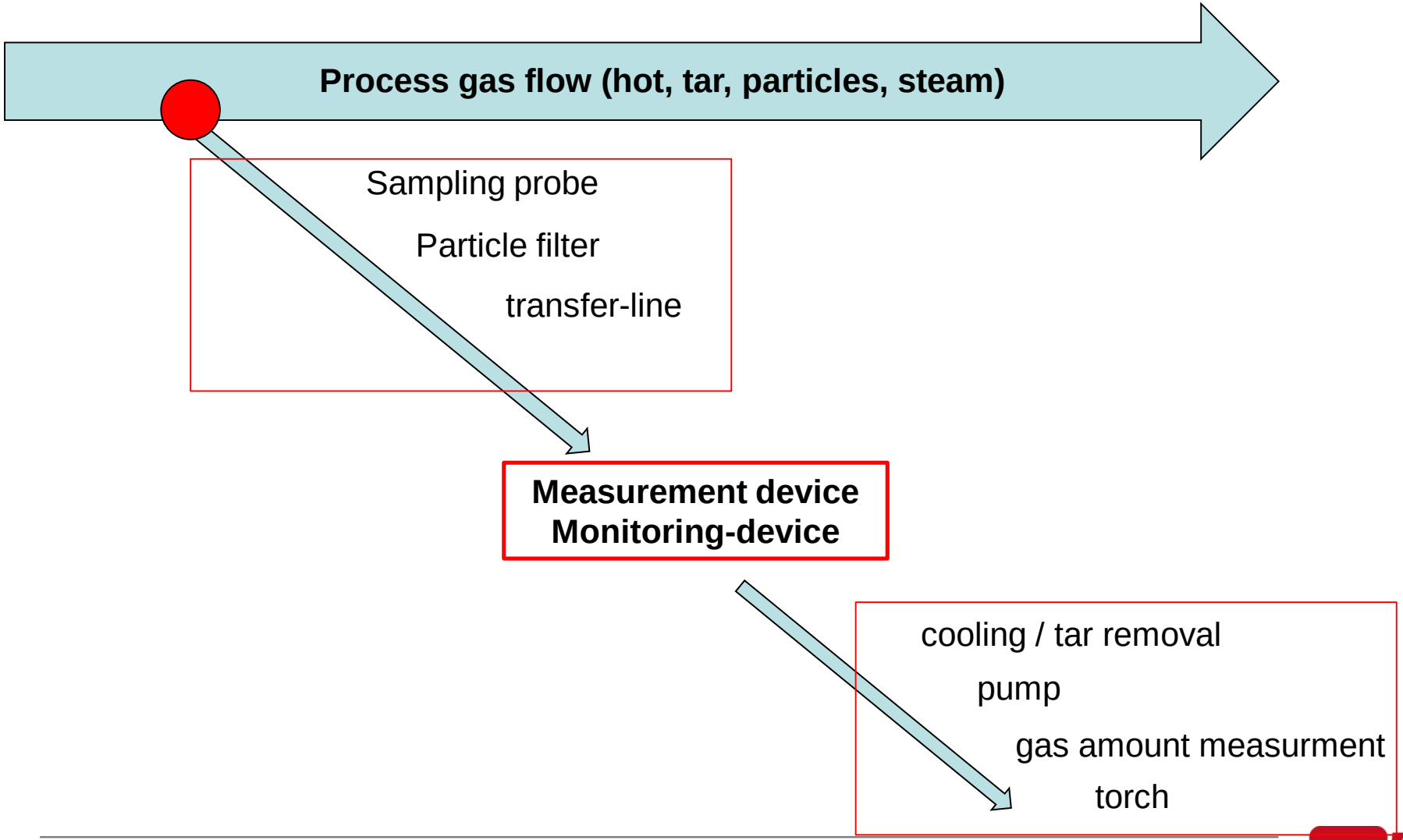
The tar-issue – recent active work

- Ratfisch tar analyzer Univ. Stuttgart – A. Gredinger
- In-line IR absorption measurements – H. Grosch, A. Fateev
- PID btg, KTH – company founded?
- LIF approach TU Berlin ‚CON-TAR‘
- ….

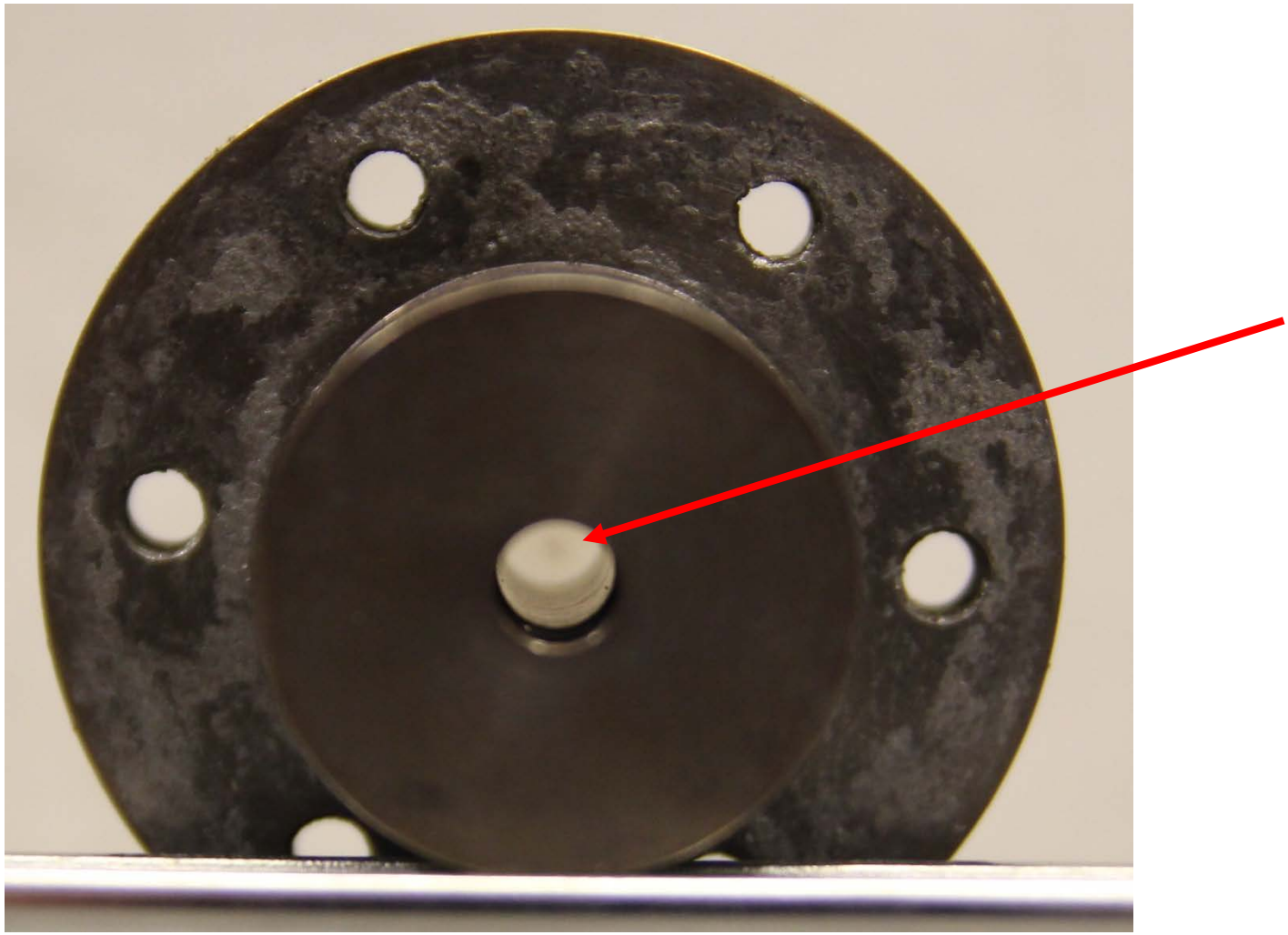
Requirements for process measurement- and analysis techniques



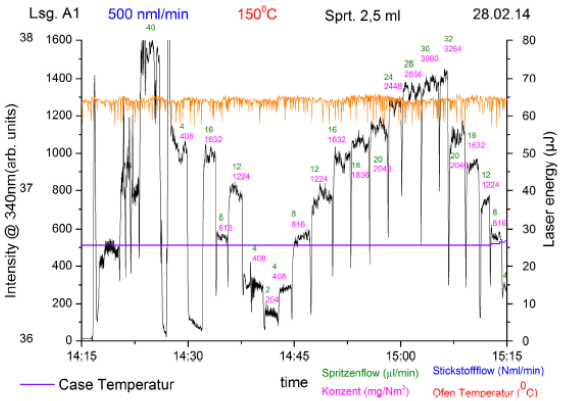
problem area 1: sampling

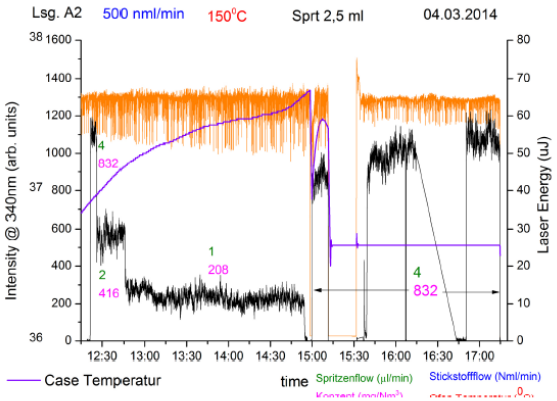


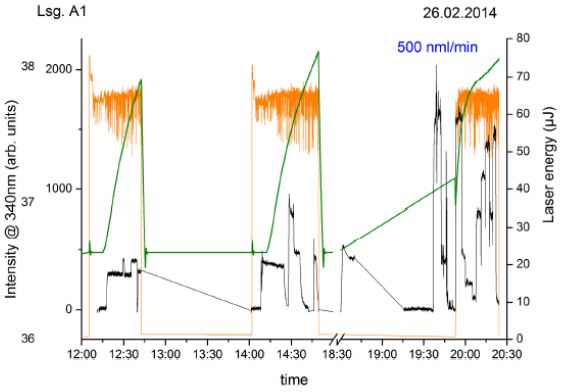
Problem area 2: contamination

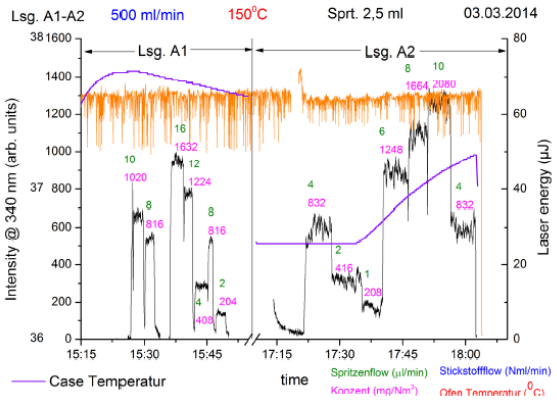


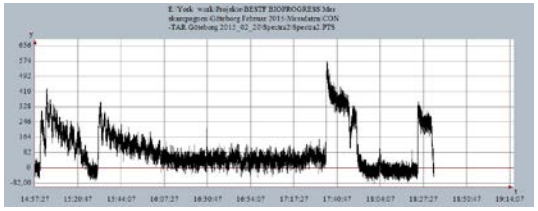
Problemfeld 3: signal stability and calibration











Problem area 4: Validation of results mit other tar analysis methods

- Comparison with mit SPA-Method
- Comparison with Tar Protocol (DIN CEN TS 15439) (ETP)
- Comparison with results from GC/MS und GC/FID
- Comparison with oher on-line tool susch as MBMS

Discussion of Methods and results in the international context in workshops and webinars:

www.gas-analysis-webinars.org

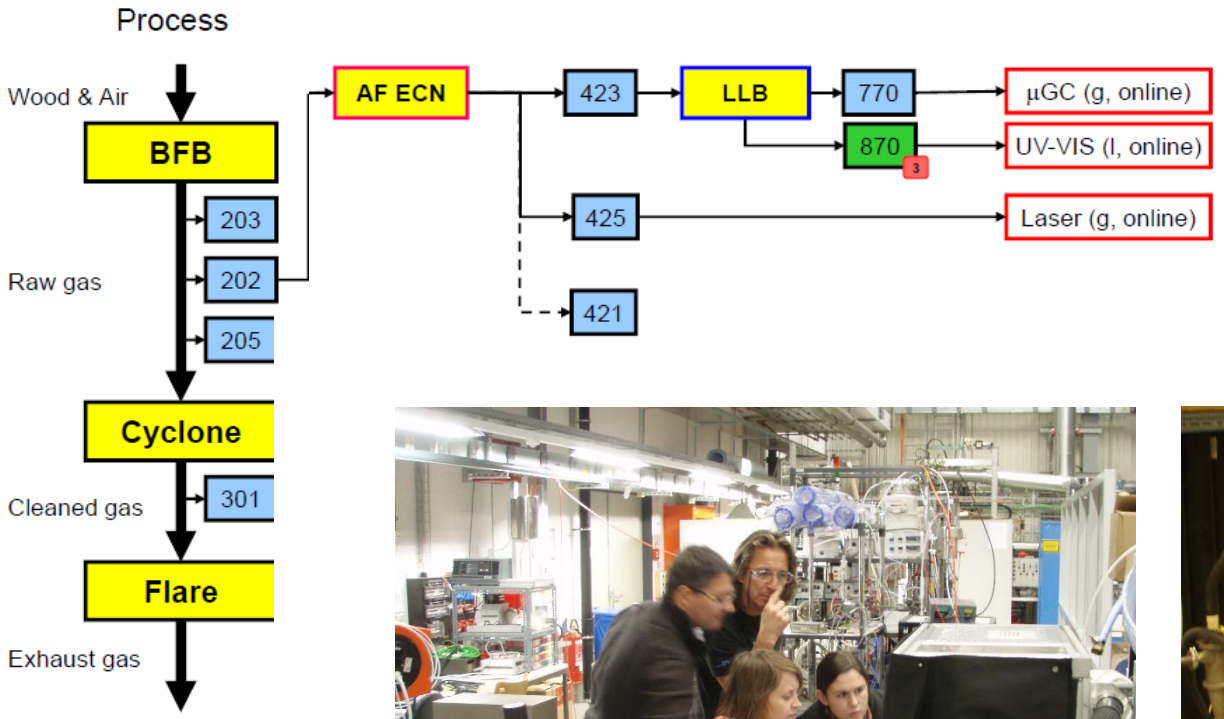
The tar-issue – validation of continuous on-line measurements

- Validating continuous measurements???
  - Test gases – evaporation, sublimation devices
  - Test gases from reactors – vtt approach
  - Real gas measurements at different host sites or test plants

- Limits of technology:
  - Optical density of the test object

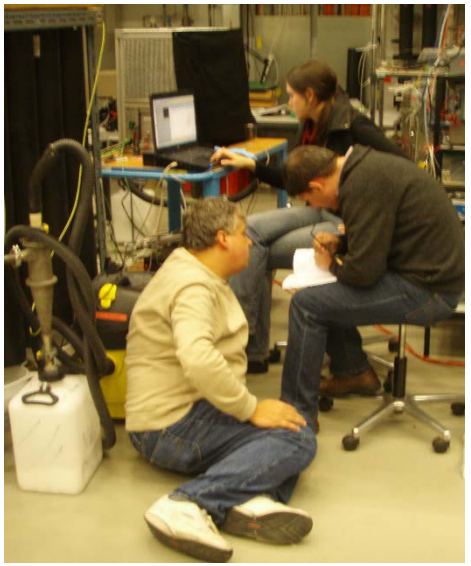
- Further activities launched for process monitoring applying optical technologies

Collaborative measurements at Paul-Scherrer-Institute in Villigen (Switzerland) in November 2013



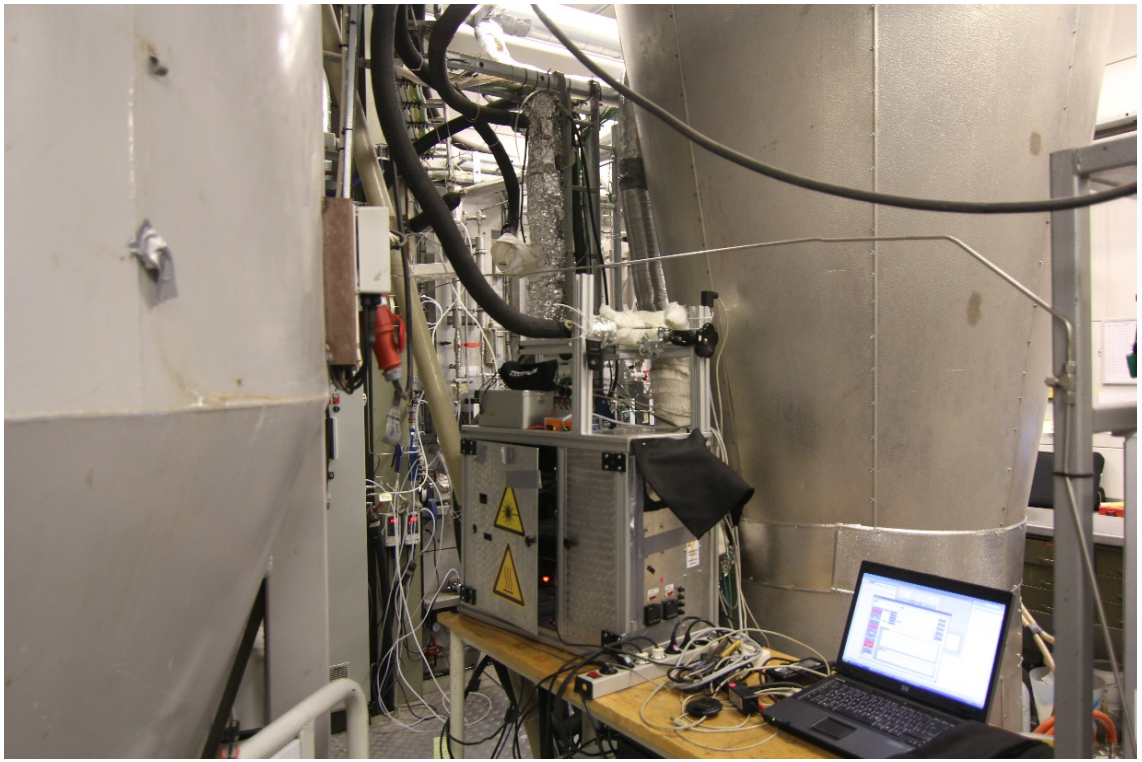
PAUL SCHERRER INSTITUT

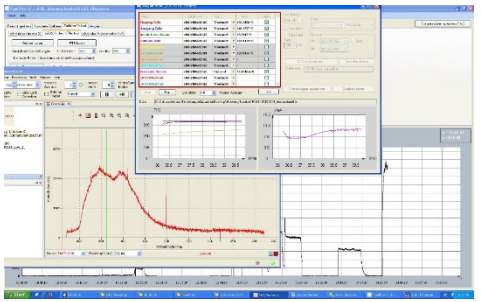
PSI

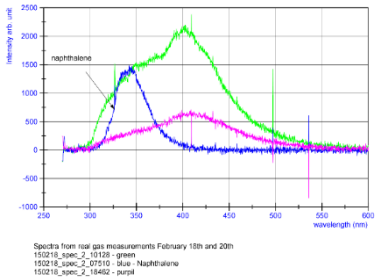


Collaborative measurements at Chalmers University Gothenburg (Sweden) in February 2015

BioProGReSs project (www.bioprogress.se)

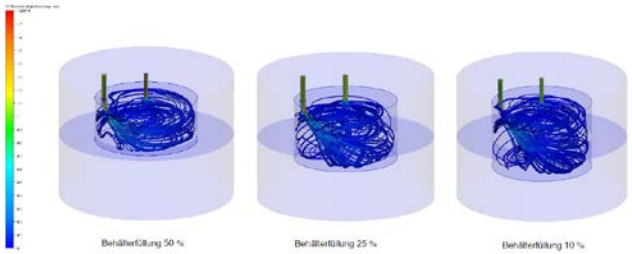


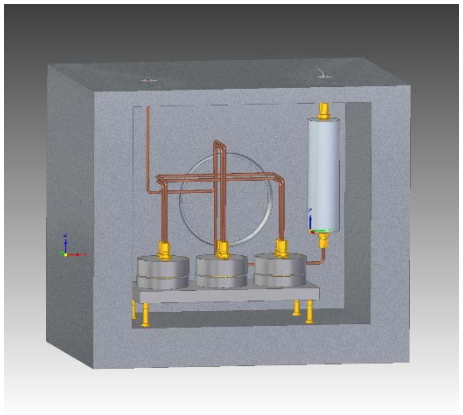


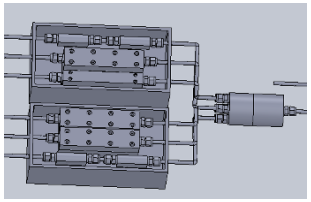


improvements

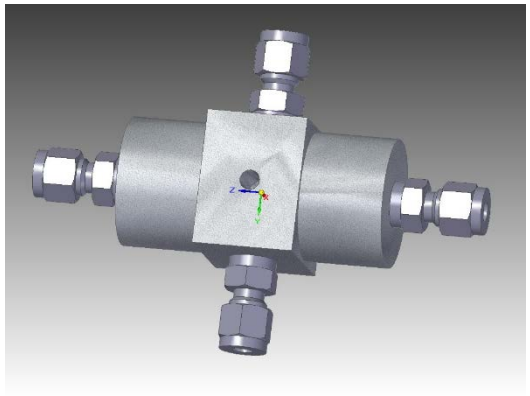
- Test gas generation

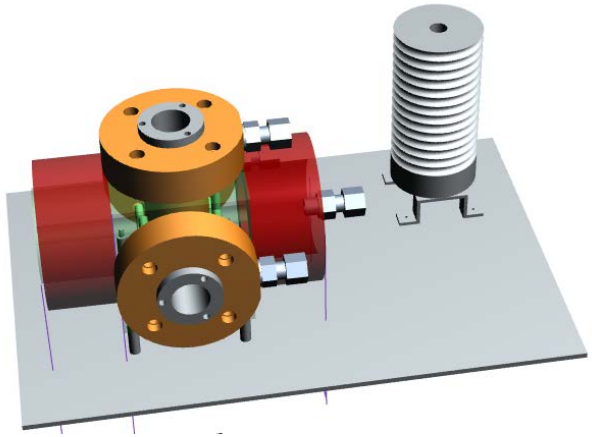




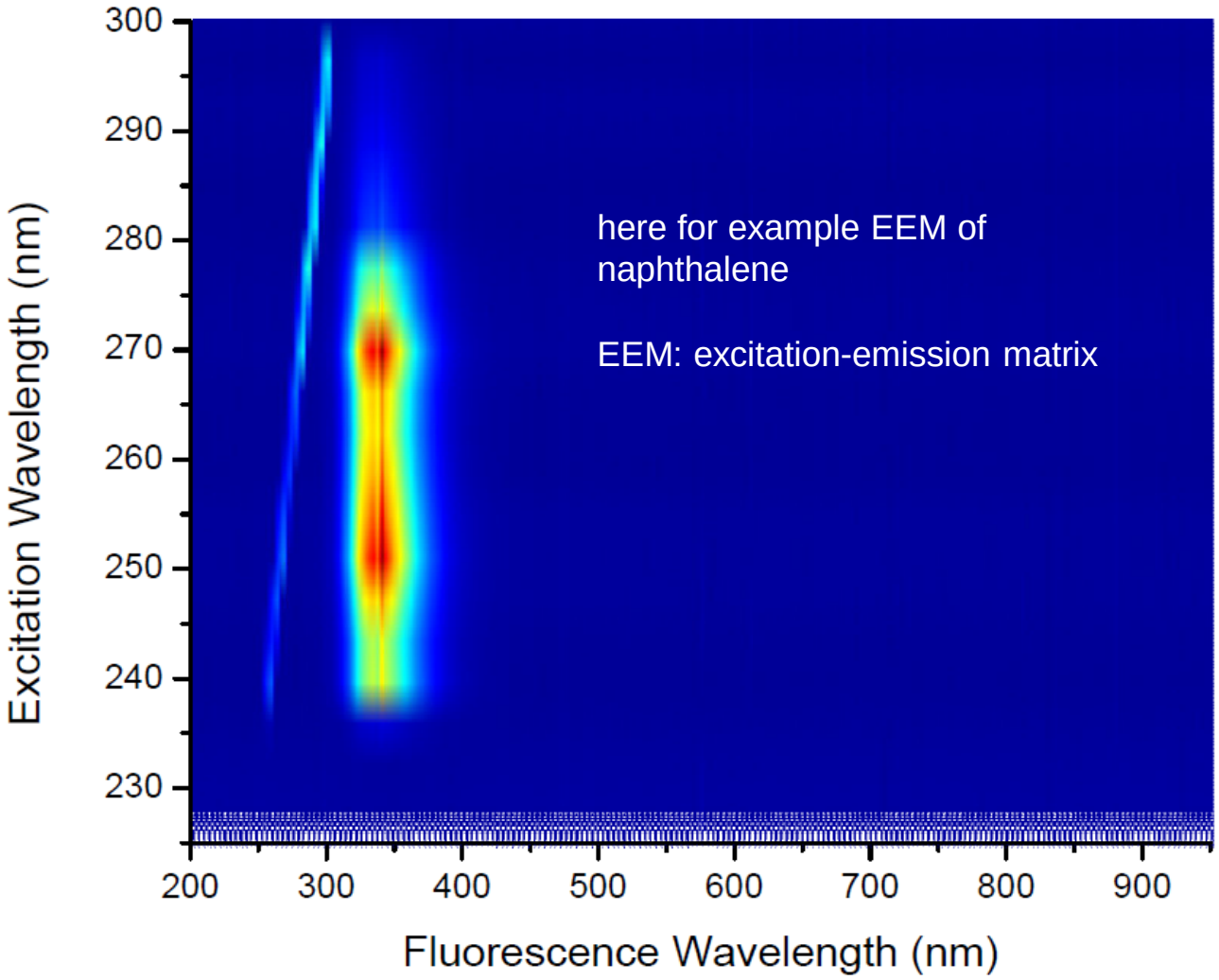


- new measurement-cell designs





Fluorescence mapping EEM



Tar issue – use of technology

- **start-up and shut-down of plants**
- **plant / process monitoring**
- **scale up issues**
- **fundamental research**
- **applied research**

How much detail is wanted and how much is needed?

Thank you…