

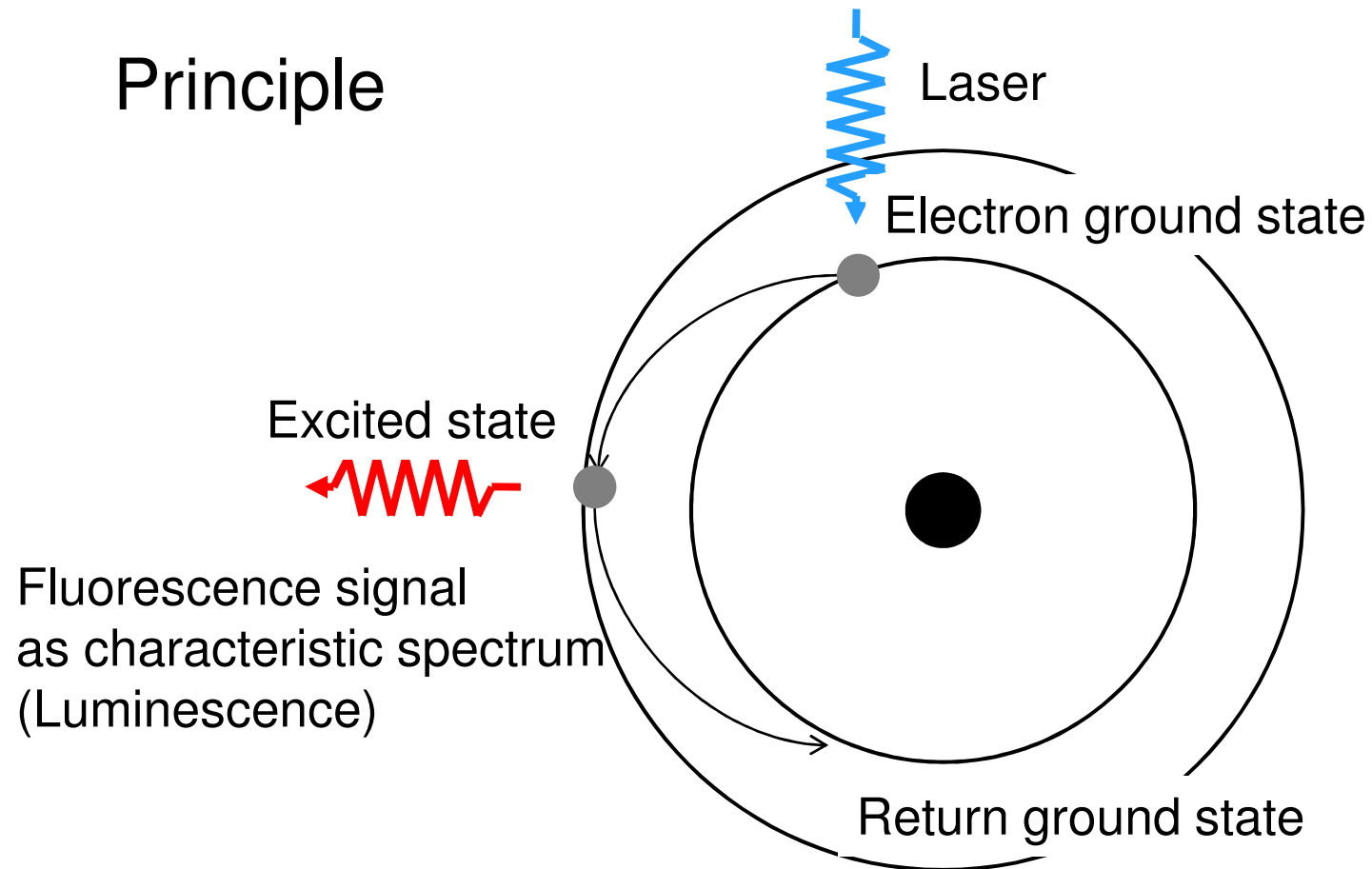
# Laser induced fluorescence for gas phase tar

Motivation:

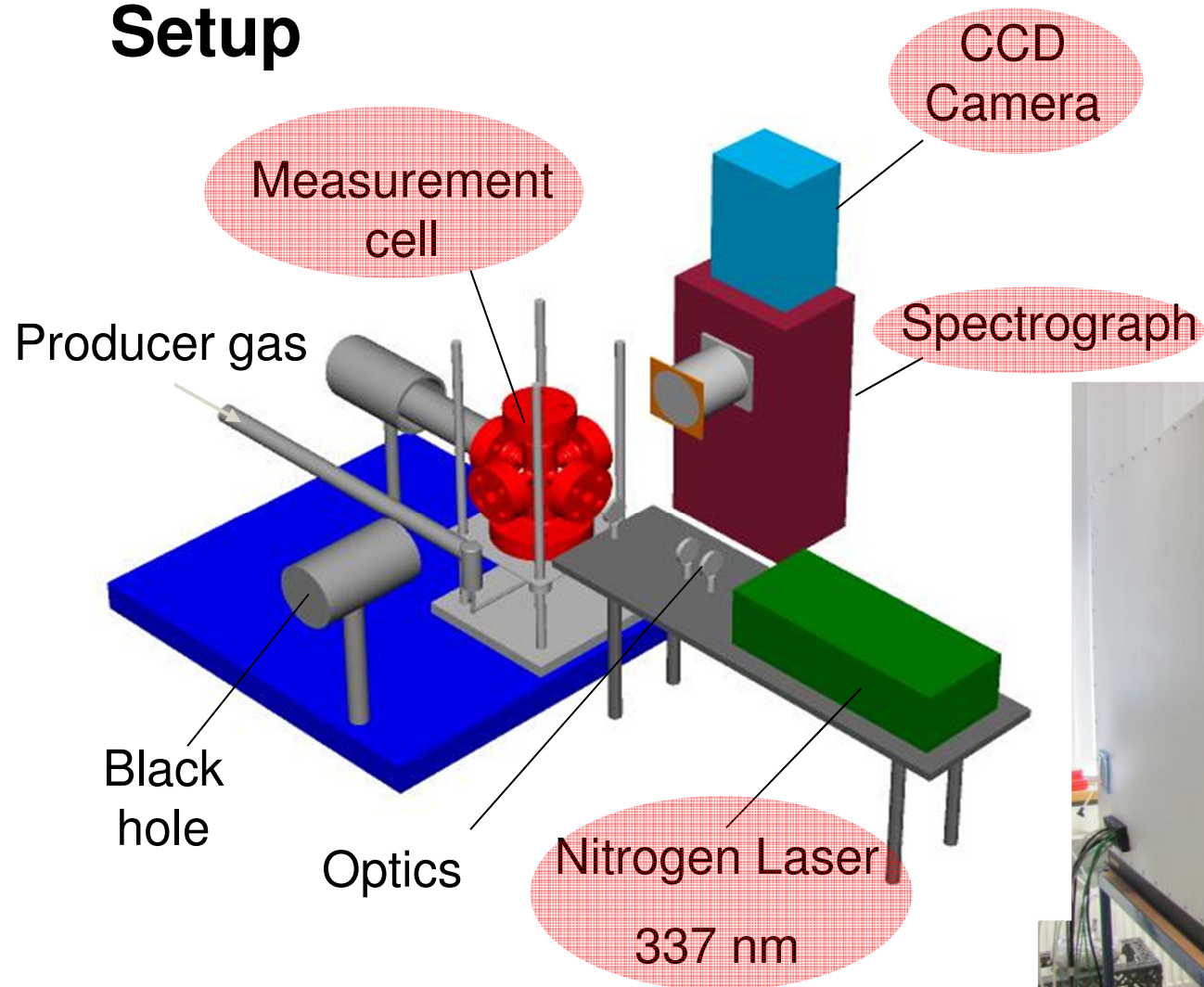
- Online
- No sampling time
- Non intrusive
- Quantitative & Qualitative

# Laser Induced Fluorescence (LIF)

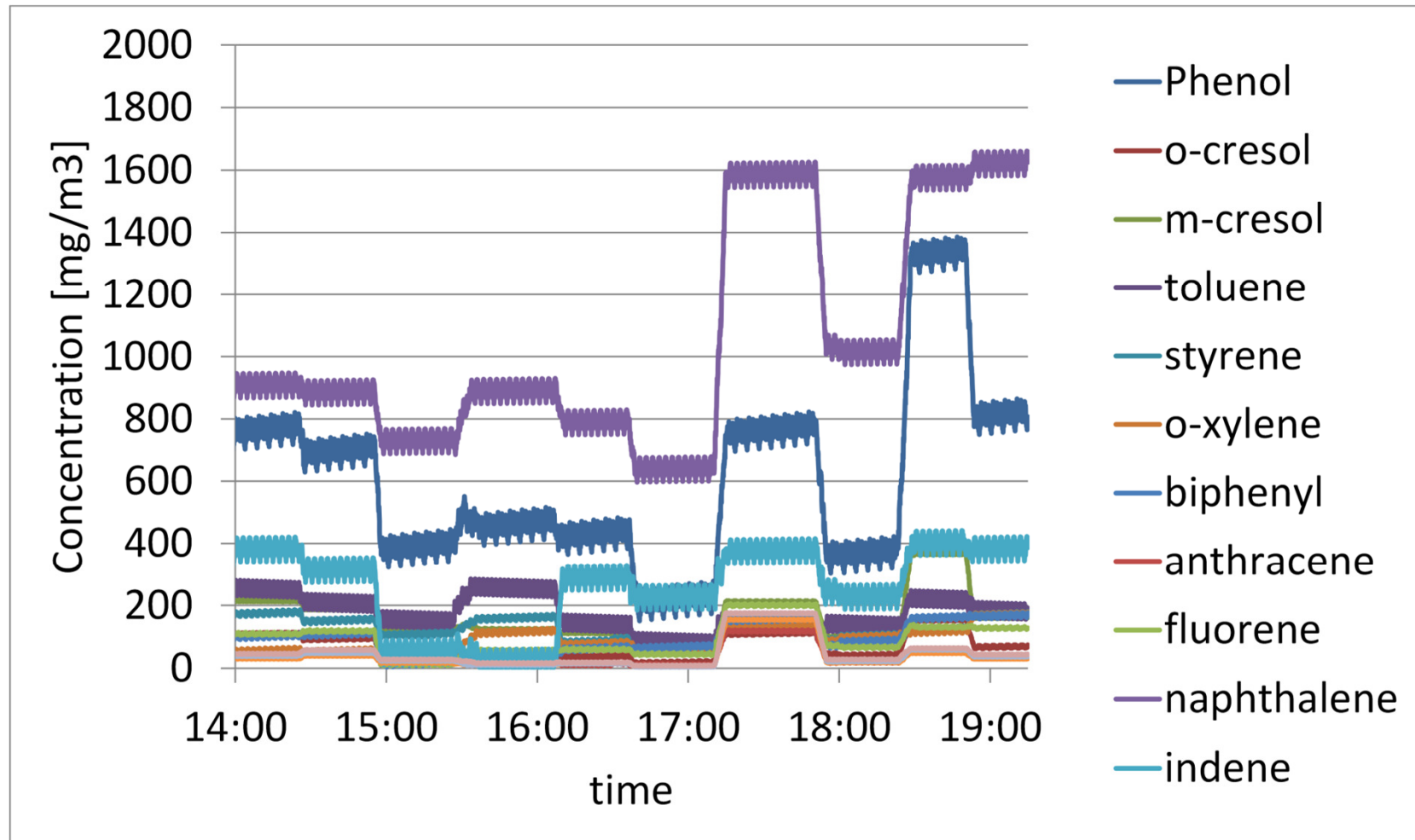
## Principle



# Setup



# First results



## Discussion

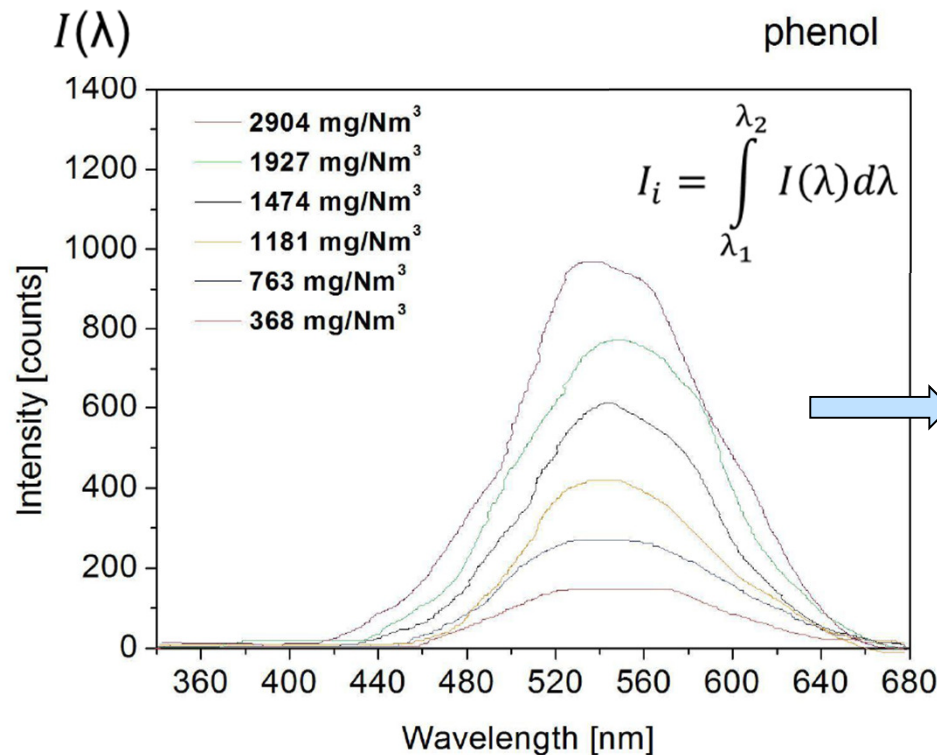
- Calibration method not satisfactory solved
- System costs (laser)
- Online, detailed information necessary?

## Current status of system development

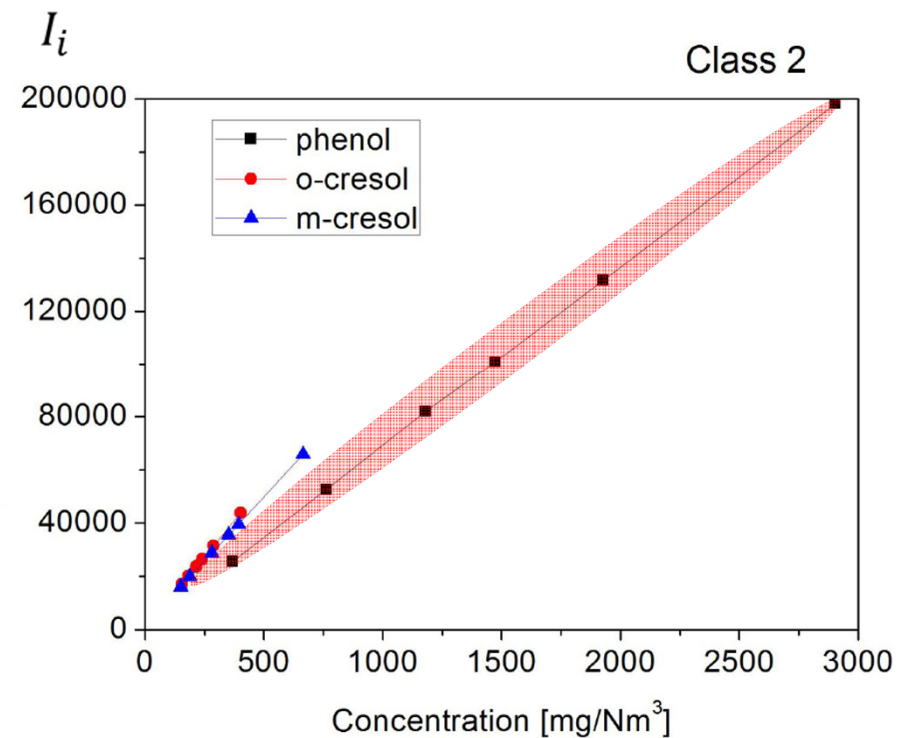
- Project finished
- Currently no subsequent projects

# Calibration

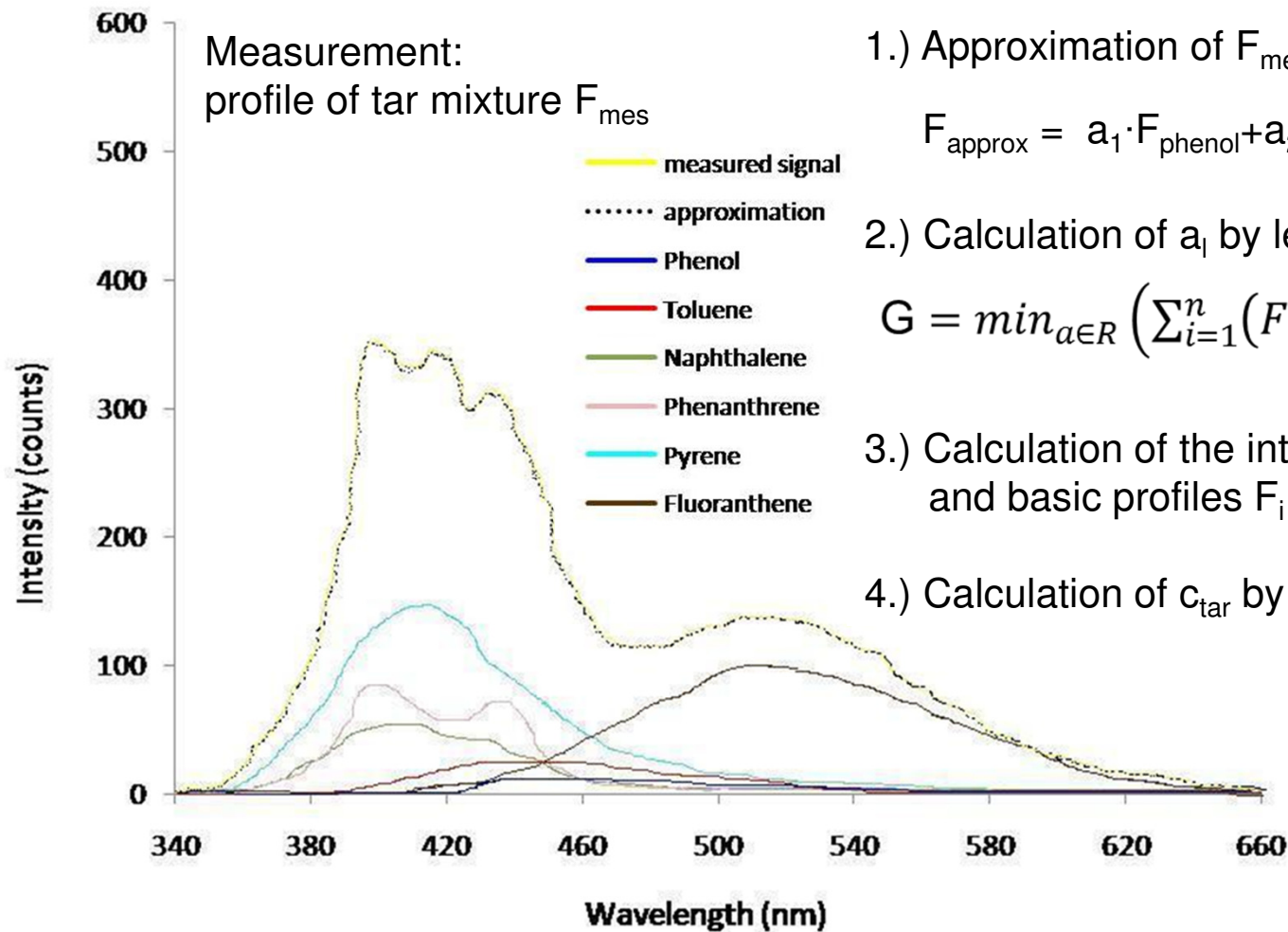
Basic profiles  $F_i$  for 14 tar compounds  
signal intensity  $I_i$  corresponds to the profile area



Linear relation between intensity  $I_i$   
and tar concentration  $c_{tar}$



# Calibration



1.) Approximation of  $F_{mes}$  by sum of basic profiles

$$F_{approx} = a_1 \cdot F_{phenol} + a_2 \cdot F_{naphthalene} + \dots + a_{15} \cdot F_{background}$$

2.) Calculation of  $a_i$  by least square fit method

$$G = \min_{a \in \mathbb{R}} \left( \sum_{i=1}^n (F_i^{mes} - \sum_{l=1}^{15} a_l F_i^l)^2 \right)$$

3.) Calculation of the intensity  $I_i$  by  $a_i$   
and basic profiles  $F_i$

4.) Calculation of  $c_{tar}$  by linear correlation