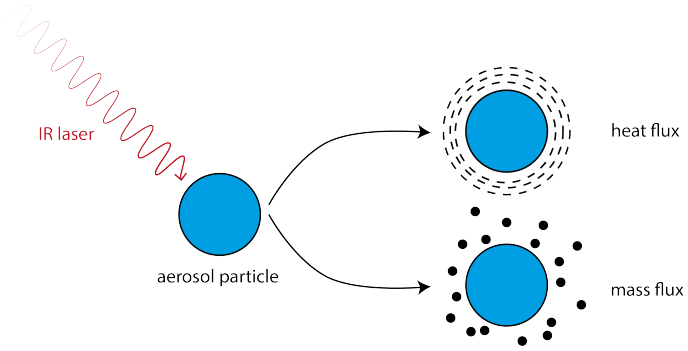
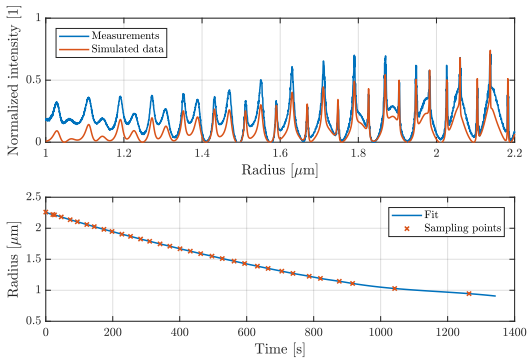
Automated and robust size fitting of micrometer sized aerosol particles





Light scattering is an effective and highly accurate technique to determine the size of single aerosol particles in the micrometer range. Observing the temporal evolution of the scattered light intensity of a shrinking particle reveals a unique and characteristic peak structure. This peak structure can be used to obtain the particle radius with nanometer resolution by fitting the measured light intensity with theory. So far, this fit was performed manually by matching characteristics peaks in the simulation and experiments.

This process should be now automated to perform a fast, robust and reliable size-fitting for a better understanding of fundamental aerosol processes. For this purpose, different approaches from time series analysis such as dynamic time warping should be evaluated and the optimal algorithm for this problem selected.

Goals & Tasks

- Develop an automated approach for fitting experimental light scattering data of single aerosol particles with simulation results
- Implement a robust solution capable of fitting noisy measurements from real world experiments
- Exploring the suitability of different approaches like dynamic time warping

Qualifications

- Interest in time series analysis and applied machine learning
- Basic knowledge of machine learning or signal processing
- Registered to one of the following:

  ☐ **Bachelor Thesis**

  ✓ **Seminar Project**

  ✓ **Master Thesis**

Contact

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