



KTH CCGEX

Particulate characterization in the gas exchange system of DI/SI engines

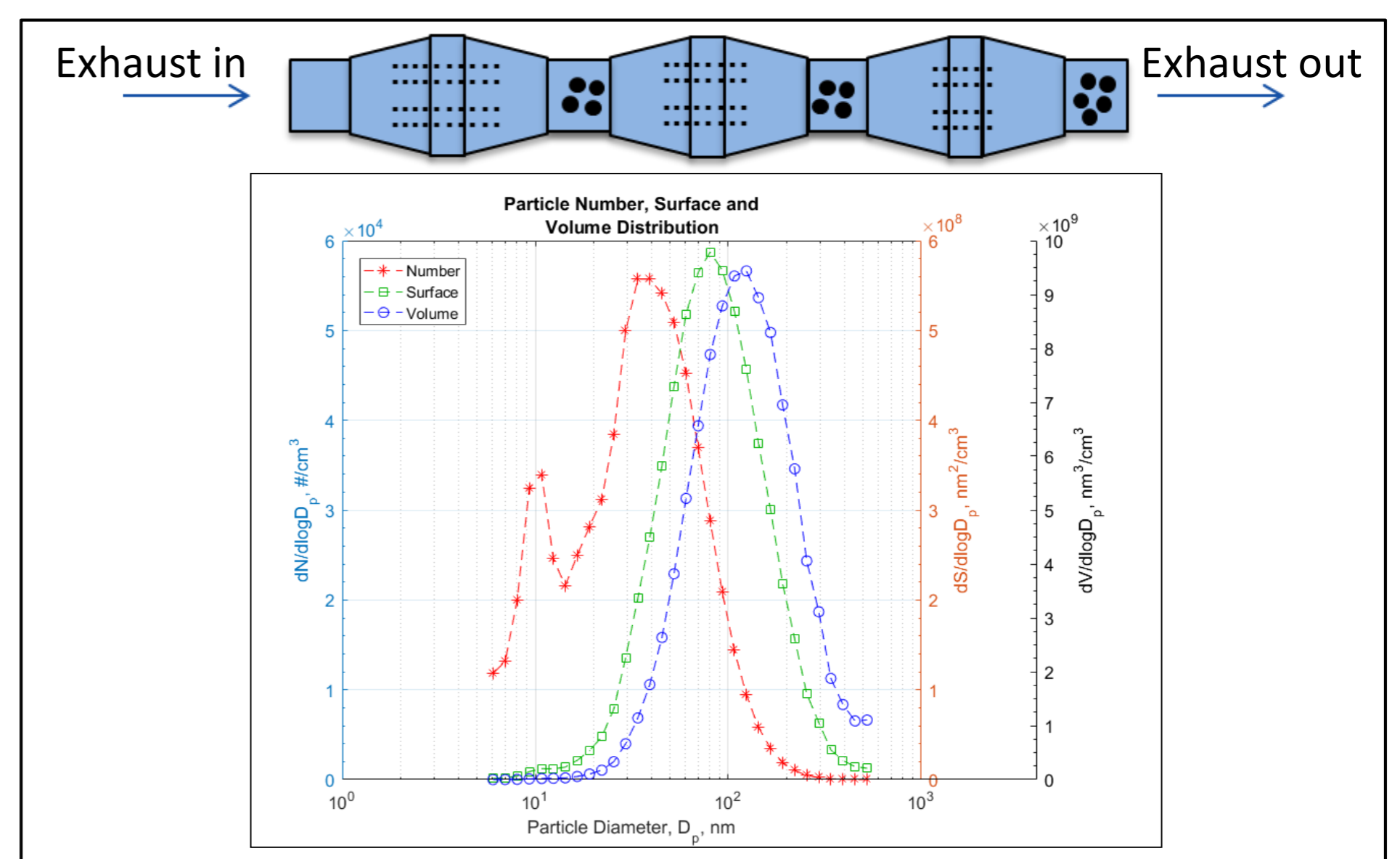
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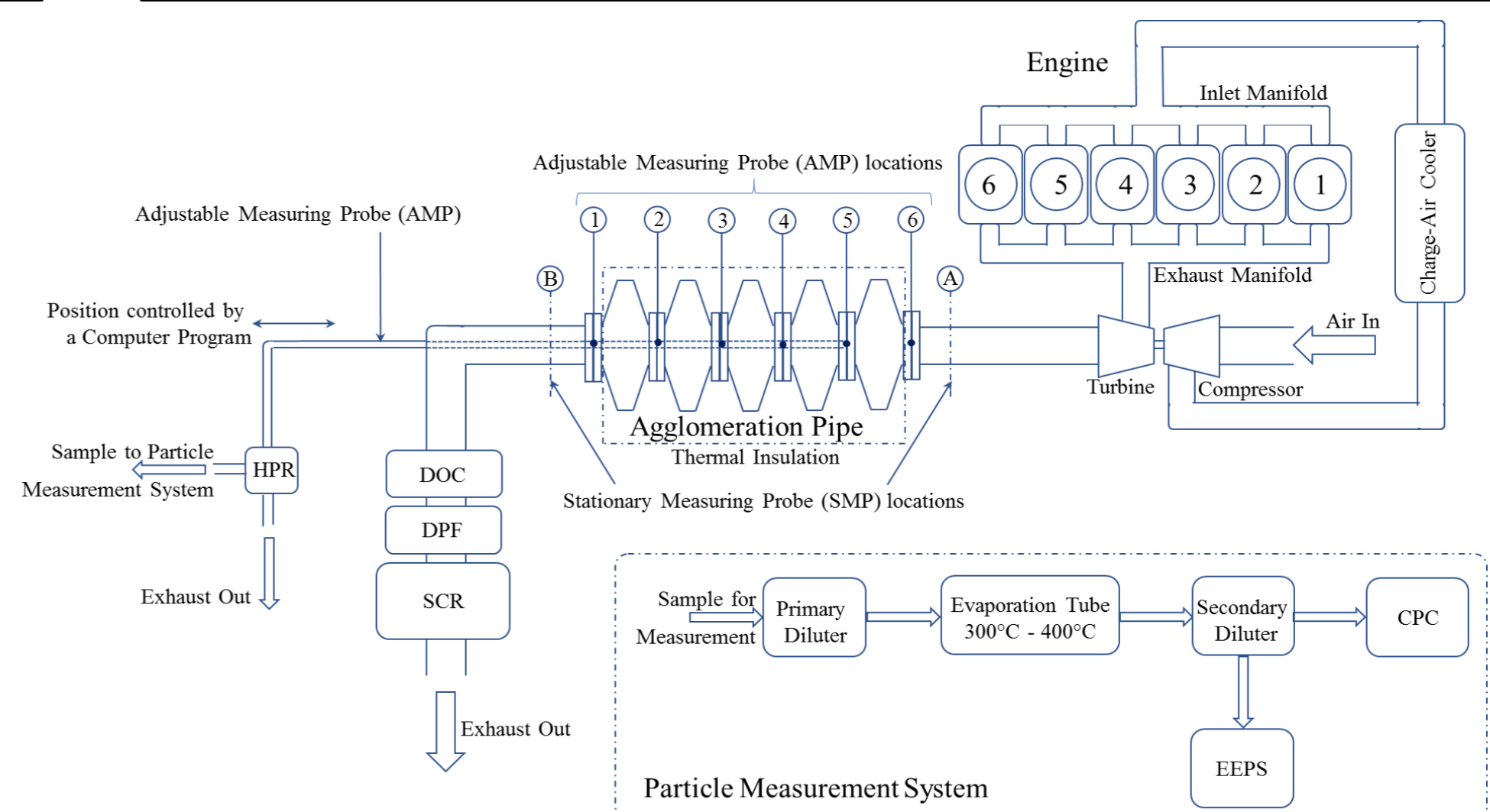
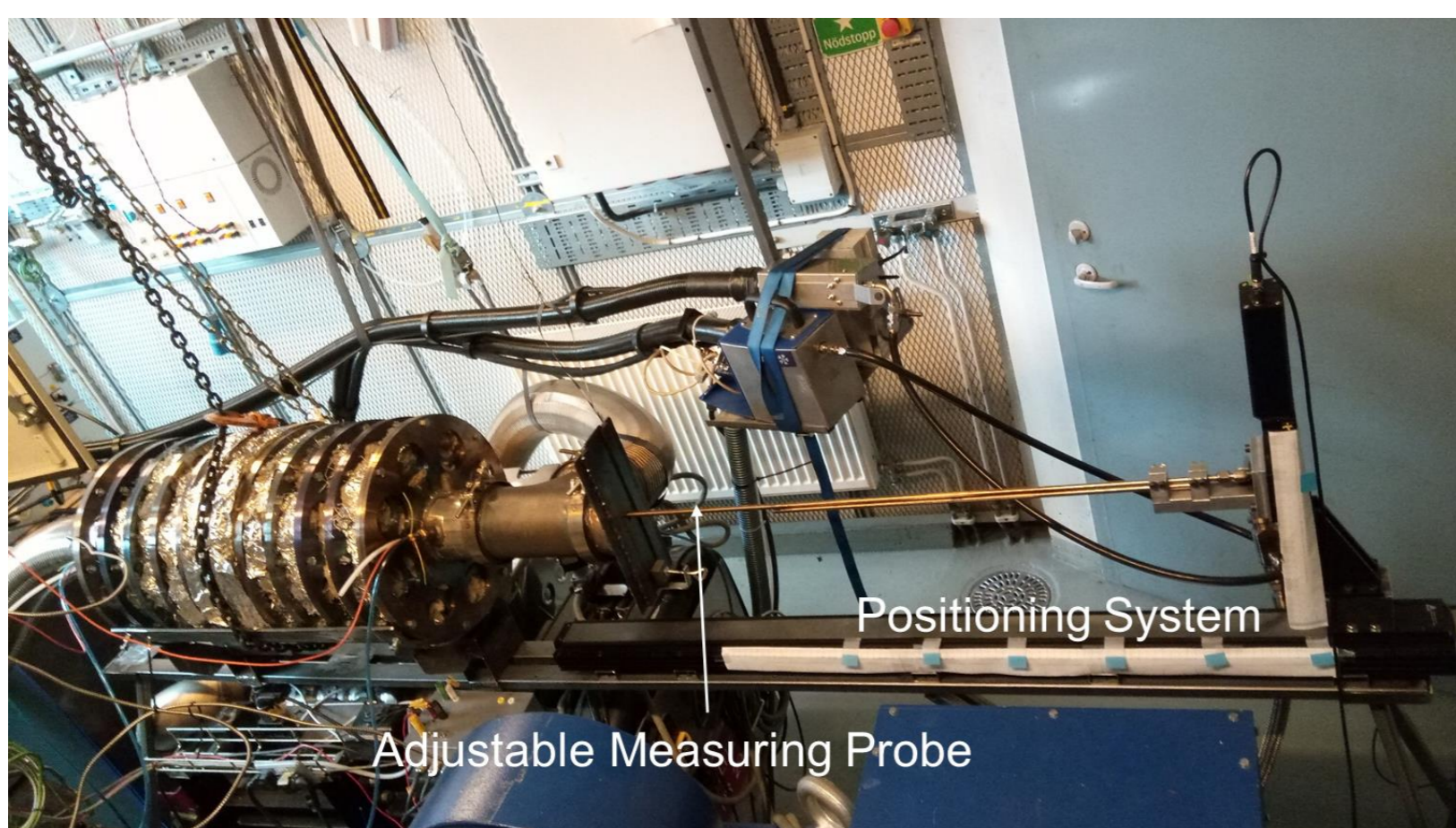
The work is aimed at reducing the particles emitted from a DI/SI engine. Understanding the evolution of particles in the exhaust system of a DI/SI engine is a step towards it. The influence of the various geometries in the exhaust line will be studied. For this purpose, particulate size distributions will be measured along the exhaust system of an engine. A 1-D model of the evolution of particle size distribution will be subsequently developed. Based on the gained knowledge, a hydrodynamic agglomeration device will be tested for particle grouping and the devices shall be fine-tuned for best agglomeration of particles.

Objectives:

- Understanding the evolution of particles along the exhaust line across the exhaust devices and various pipe geometries
- Building agglomeration devices (hydrodynamic and acoustic) for reducing the total number of particles emitted
- Developing a 1-D model of particle size distribution change in the exhaust system



Agglomeration Pipe with the Adjustable Measuring Probe



Research questions (2018-19)

- How does particle size distribution change along various pipe expansions?
- How does sampling line influence the measurement of particles?

Research activities (2017-18)

- Design and fabrication of the agglomeration pipe and moving measuring probe system – completed!
- Experimental Campaign on the Measurement of particle number and the size distribution under various steady state engine operating points with the standard agglomeration device – completed!

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