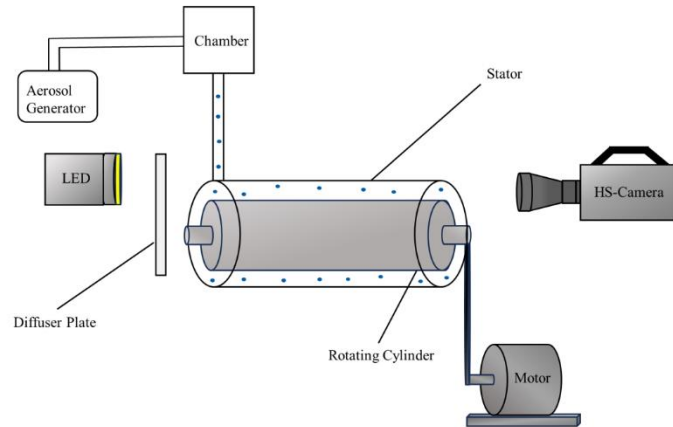


Master Thesis

“Characterization of an Aerosol Generator and Flow Homogeneity in a Cylindrical Gap.”



Electric machines generate heat due to electrical losses and mechanical friction, with cooling in the rotor-stator gap typically limited to air circulation. This study explores the effect of introducing small liquid droplets into the airflow to enhance heat transfer. By investigating aerosol-based cooling, this research aims to enhance thermal management and improve the efficiency of electric machines.



The project involves designing a small gap (outer cylinder), and connecting it to an existing setup, then conducting experiments to generate and analyze aerosol flow in the gap. The impacts of droplets will be recorded and analyzed, then the aerosol generator with 3 different nozzles will be characterized.

Requirements:

- High motivation and interests in experimental work
- General knowledge of fluid dynamics
- Familiarity with LabVIEW/Arduino, CAD software (NX, SolidWorks,) is advantageous.
- Hands-on experience with sensors, high-speed cameras, and image processing (MATLAB, Python, etc.) is advantageous.

Tasks:

- Design the gap, conduct experiments with the aerosol generator, and record data.
- Characterize the aerosol generator by measuring the droplet size, velocity, and mass distribution.
- Analyze and evaluate the experimental results.

Starting time: as soon as possible

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