

Seminar Title	: Study on Micro Grooved Gas Foil Thrust Bearings through Numerical Simulations and Experiments
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Venue	: ME-001, Seminar Room
Date and Time	: 24 Sep 2024 (4:00 PM)
Abstract	<p>: Gas foil thrust bearings (GFTBs) are a sophisticated class of air-lubricated bearings intended to sustain axial loads in high-speed rotating machinery. In contrast to traditional fluid-film bearings, GFTBs use a thin film of gas and smooth top foil to interact with it and produce an aerodynamic pressure. Corrugated compliant foils are placed beneath the smooth top foil to tailor the stiffness, damping, and load-carrying capacity of the bearings. Because of their unique design and materials, GFTBs can function at high temperatures and speeds, which makes them ideal for use in high-speed turbomachinery, and other high-performance rotating machineries. GFTBs operate cleaner since they do not use liquid lubricants, which reduces problems with oil contamination and degradation. Utilizing cutting-edge materials and design improvements, recent developments in GFTB technology have improved load capacity, stability, and longevity. Although gas foil bearings are better for the environment, they nevertheless have drawbacks, like insufficient lubrication because air has a lower viscosity. Efforts are being made to improve the functionality and design of these bearings.</p> <p>The current research aims to conduct computational simulations and experimental studies on various types of microgroove texture on the top foil of GFTBs within high-speed applications and compare their performances. The microgroove gas foil thrust bearings examined in this study include (i) Rectangular Straight groove, (ii) Herringbone groove, and (iii) Spiral groove. Subsequently, all micro groove textured geometry will undergo optimization using artificial intelligence techniques like ANFIS based on the obtained performance parameters. The anticipated outcome of this research is to provide valuable insights into the feasibility and advantages of employing micro groove textured bearings over conventional gas foil thrust bearings.</p>