Special Issue

Turbulence Models for Turbomachinery

Message from the Guest Editors

Turbulent flow, characterized by chaotic changes in velocity and pressure, is still an unsolved problem. Turbomachinery are the most used machines in all areas. They exist in almost every engineering system. Carrying out research on turbulence in these rotating systems is quite a challenging task. Numerous experimental techniques are applied in the complex research of turbulence in turbomachinery, from classical ones to the novel ones, such as the following: Fast-response multihole probes; Three-component velocimetry systems; High-speed stereo particle image velocimetry; Holographic particle image velocimetry.

On the basis of the acquired experimental data, numerous turbulence models for flows in turbomachinery can be developed and tested, with the roles of the RANSs (Reynolds-averaged Navier–Stokes equations), LESs (large eddy simulations), hybrid RANS-LES modeling, DNSs (direct numerical simulations), and data-driven turbulence modeling in turbomachinery industry having great importance and potential.

Thus, this Special Issue will present a discussion on various turbomachinery geometries (radial, diagonal, axial) inbuilt in pipes, diffusers, jets, etc.

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