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Hydrodynamics in Pressurized Pipe Systems

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Message from the Guest Editor

Dear Colleagues,

The field of hydrodynamics, the study of fluids in motion, presents a vast array of challenges, spanning scientific and engineering realms. Among these challenges, the task of understanding and predicting transient flow phenomena, especially in pipe systems, stands out.

Transient pipe flow poses unique challenges due to its dynamic nature, where the fluid flow conditions rapidly change in response to factors like valve operations, pump start-ups or shutdowns, and sudden changes in flow rate or pressure. Water hammer, a key concern in transient flow, can lead to pressure surges that can potentially damage the system, thus necessitating sophisticated modeling techniques and control strategies for mitigation.

Beyond the transient flow challenges, hydrodynamic research grapples with broader issues such as optimizing fluid transport efficiency, reducing energy consumption, and mitigating environmental impacts. Understanding turbulent flow behavior, for instance, is crucial across various industries, [...]

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