

On the energy loss maximization in rotor-driven gas-liquid flows

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Objectives: To elucidate the mechanisms behind the local maximization of energy loss in rotor-driven gas-liquid two-phase flows, thereby providing fundamental insights for energy savings and optimal industrial equipment design.

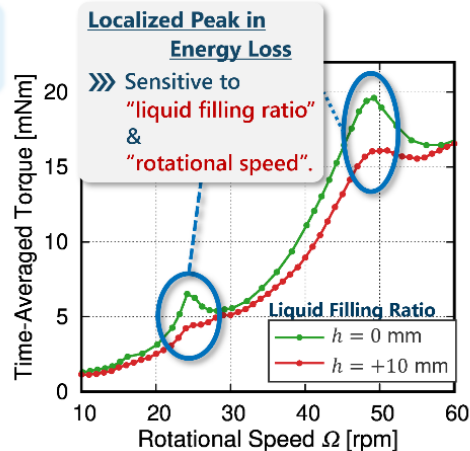
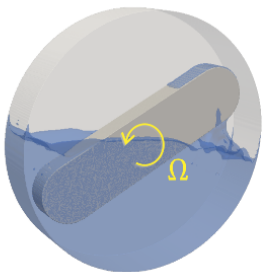
Contents: Integrated experiments and large-scale numerical simulations to analyze the detailed spatiotemporal dynamics of fluid motions and gas-liquid interface waves in rotor-driven systems.

Results: The local maximization of torque under resonant conditions is driven not only by direct rotor-liquid surface collisions but also by significant pressure imbalances around the rotor.

Computational resource: Large-scale numerical simulations were performed using SQUID at the D3 Center, The University of Osaka.

Gas-Liquid Two-Phase Flow Driven by a Rotor

» Occurrence of resonance phenomena.



Visualization of Forces Using Numerical Simulation

