

Abstract Submitted  
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**Stabilities and transitions of vertical circulating flows induced by a small fan set on a lake surface** TAKASHI NAKAZAWA, HIROSHI SUITO, Okayama Univ., Japan — The purpose for this research is to analyze flow patterns for the swirling upper-lid driven cavity flow in cylindrical coordinates. The swirling upper-lid driven cavity flow is very important for a water quality improvement in lakes. To survey aspects of such flows numerically and mathematically in a simple system, the flows induced by the top boundary condition which forces a horizontal rotating flow is investigated here. Simulations of flows created by the top boundary condition are carried out to obtain steady-state solutions with various Reynolds numbers and analyze stabilities and transitions.

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