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Interactions between bathtub vortices in a rotating experiment[1]
DANIEL VAN BEVEREN, Haverford College, DANIEL LATHROP, University of Maryland — The bathtub vortex is a flow pattern uniquely suited for laboratory study, as the flow through a drain hole provides a radial inflow and vortex stretching in a controlled location, thus stabilizing the vortex. While these radial flow patterns provide stability, the attraction they cause between any number of such vortices makes it difficult to achieve a stable state of multiple bathtub vortices, thus limiting their utility as models for experimental study of vortex interactions. Here we test the effect of global rotation on such vortices by spinning a cylindrical container with two drain holes in the bottom, which we find allows the formation of multiple bathtub vortices in a co-rotating stable state. The orbit period of these vortices is observed to change with the global rotation rate, and apparently spontaneous switching between states with different numbers of vortices is observed, with larger numbers of vortices possible at higher global rotation rates.

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