

Abstract Submitted  
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**Study of mixing at low Reynolds number** R.M. ARCO, R. ZENIT, Universidad Nacional Autonoma de Mexico, E. LAUGA, University of California - San Diego — In many mixing applications is often impossible to operate the mixer in turbulent regime due to the high viscosity of the liquid used (polymers solutions). In this study we propose a technique to induce mixing in laminar flows. A flapper is oscillated at certain frequency and the flow field around it is studied with a PIV technique. The rigidity of the flapper is varied using different materials (acrylic, neoprene). The time-reversibility of the flow was broken when the flapper became flexible. Also we used a Newtonian, and non-Newtonian fluids with elastic effects and nearly constant viscosity. All test were conducted at  $Re < 0.02$ . Velocity profiles were measured having a impeller oscillation with  $\pm 60$  degrees from the vertical, measurement were taken in the vertical position varying the angular velocities for each impeller. Both the increase of flexibility of the impeller and the increase of the angular velocity was seen to modify the pumping capacity in both fluids. In this talk the nature of this behavior and its implications in mixing processes will be discussed.

Roberto Zenit  
Universidad Nacional Autonoma de Mexico

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