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Flow structure in a turbulent stationary breaker JAVIER RODRIGUEZ-RODRIGUEZ, ALBERTO ALISEDA, JUAN LASHERAS, Department of Mechanical and Aerospace Engineering, University of California, San Diego — The flow in the air-entraining region of a deep-water stationary breaker has been studied using a combination of high-speed visualizations and feature tracking techniques (FTT) similar to those used in PIV. Instantaneous velocity measurements obtained with the FTT clearly show the existence of large coherent structures that develop similarly to those observed in stratified mixing layers. The dynamics of these large coherent structures has been characterized for a number of experimental conditions. This has allowed us to relate the mean convective velocity and growth rate of the structures with the relevant parameters of the bore, namely the free stream velocity of the unperturbed fluid and the jump between the upstream and downstream heights. Moreover, when the velocity field is averaged in time, a recirculation bubble generally referred as the “roller” in the literature, has been found. The average velocity profiles in this recirculating region exhibit a self-similar behavior. Supported by ONR grant N00014-05-1-0121.

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