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Simultaneous particle image velocimetry (PIV)-Schlieren photography of fluid flow in liquid induced by plasma-driven interfacial forces JANIS LAI, JOHN FOSTER, University of Michigan, UNIVERSITY OF MICHIGAN TEAM — Understanding the transport of plasma-derived reactive species into bulk liquid is crucial for effective plasma-based water purification and other environmental applications. Physical and chemical interactions at the plasma-liquid interface region drive flow in the bulk liquid. The mechanisms of such flow are not well-understood. A 2-D plasma-in-liquid apparatus is used to study this interface region to understand the plasma-driven fluid dynamics. Previous shadowgraphs showed density gradients in the bulk liquid, while particle image velocimetry (PIV) measurements showed the velocity shear at the interface region. These measurements indicate the presence of fluid instabilities. Using simultaneous PIV-Schlieren photography, the interplay effect of such instabilities observed in the bulk liquid is investigated to better understand the plasma-driven forces at the interface, such as possible contribution of Marangoni flow.

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