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Experimental investigation on turbulence modulation in a bubble turbulent flow TANY THOMAS, PARTHA GOSWAMI, IIT Bombay — Gas-Liquid contact methods are quite ubiquitous in industrial operations. The understanding of transport processes across their interface is crucial in determining the efficiencies of processes and designing chemical engineering equipment. A common gas-liquid contact method is **bubbling gas into the liquid**. The presence of these **bubbles can modulate the turbulence** of the system. With the controlled addition of bubbles, the quantitative **estimate of change in turbulent energy budget for a range of Reynolds number** in wall bounded flows are yet to be addressed. In our current work, we study the bubble induced **pseudo turbulence generation** in a quiescent liquid and **effect of bubble on turbulence modulation at low Reynolds number** turbulent flow. The experiments are conducted in a **square duct**, in which **secondary flows** play an important role. We have used **Particle Image Velocimetry (PIV)** for prediction of simultaneous dynamics of the phases. An **image separation technique** has been employed to separate bubble phase from the seeding particle images and further analyzed to obtain simultaneous velocity and velocity statistics of both phases. We observe that the addition of bubbles, drastically change the mean velocity profile of the liquid phase and influence the energy spectra. We have **predicted the bubble diameter at different air flow** rate in our range of study along with change in **turbulent kinetic energy as a function of air flow rate**

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