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Bag Breakup of Liquid Jets in Gaseous Crossflow[1] KHALED SALLAM, CHEE-LOON NG, RAMPRAKASH SANKARAKRISHNAN, Oklahoma State University — The present investigation carried out measurements of a variety of properties for nonturbulent and turbulent round liquid jets exposed to gaseous crossflows within the bag breakup regime, as follows: properties of column and surface waves, number of bags along the liquid column, droplets size after breakup, droplets velocity distributions after breakup, and trajectories of the liquid droplets. Pressure-fed supercavitating nozzles having sharp-edged orifices were used to create uniform nonturbulent round liquid jets while injector with length to diameter ratio greater than 40 were used to create the turbulent round liquid jets. The liquid jets were injected across a windowed section of a wind tunnel. The waves and breakup processes were observed using high speed imaging and single and double pulse shadowgraphy. New findings of leeward surface waves along nonturbulent liquid jets in crossflow were captured by observing the downwind side of the liquid jet. Phenomenological analyses were effective to interpret and correlate the new measurements.

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