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Injection of micron size droplets into vacuum[1] CAROLINE LIU, JOHN POULOSE, The University of Texas at Dallas, DAISUKE OGAWA, Chubu University, MATTHEW GOECKNER, LAWRENCE OVERZET, The University of Texas at Dallas — Previous experiments using direct liquid injection into plasma for film deposition produced films that had unwanted voids. We believe that the uneven deposition of polymer film is due to injected liquids not completely evaporating into the plasma and landing on the surface of the substrate instead. To address this issue, we chose to improve upon the previous film deposition chamber setup by modifying the injector to decrease the injected liquid droplet sizes. The literature presents multiple theories on liquid breakup into air and resultant droplet sizes but to the best of our knowledge, there is not much research on droplet breakup dynamics or resultant droplet sizes when liquid is injected into low pressure ($<$ 20mTorr) or vacuum. The literature states that liquid breakup in vacuum is caused by surface tension only and that the resulting droplet sizes produced by this mechanism are linearly dependent upon the orifice size. In our poster, we will describe previous work done, experimental setup along with experimental data on droplet sizes produced by orifices of various sizes when liquid is injected into low pressure.

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