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**Micro-PIV of Bubble Splitting in a Bifurcation** SAMANTHA STEPHENSON, DAVID LI, FORIAN HELLMEIER, JOHN PITRE, J. BRIAN FOWLKES, JOSEPH BULL, University of Michigan — Gas embolotherapy is a proposed treatment for cancerous tumors. For this treatment, a liquid droplet solution is injected into the bloodstream and focused ultrasound is used to vaporize droplets upstream of the tumor site, resulting in bubbles that are approximately 125x larger in volume. These bubbles will then occlude the blood vessels, thereby depriving the tumor of nutrients leading to eventual tumor necrosis. However, once the bubbles are formed, they will continue to travel through the bloodstream, through bifurcations that split in to smaller daughter vessels before lodging to occlude flow. Micro-particle imaging velocimetry (PIV) was used to study the flow field surrounding the leading edge of the bubble at the bifurcation point. Consistent symmetric bubble splitting at several different flow rates was achieved. Roll angle of the bifurcation was varied to encourage uneven bubble splitting and reversal. In the absence of the bubble, Poiseuille flow was verified in the parent channel. Results were compared to a boundary elements model developed by Calderon et al. 2010. This research was funded by the NIH grant R01EB006476.

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