Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Numerical modeling of prostatic artery embolization: patient-specific blood flow and emboli transport CHADRICK JENNINGS, MOSTAFA MAHMOUDI, Northern Arizona University, ANDREW HALL, Saint Louis University , AMIRHOSSEIN ARZANI, Northern Arizona University — Benign prostatic hyperplasia (BPH) is the most common non-cancerous tumor found in men. Symptoms caused by BPH can be treated by a recently proposed minimally invasive procedure known as prostatic artery embolization (PAE), in which particles are injected through a catheter to limit blood supply to the enlarged prostate. The goal of this study is to characterize the complex blood flow patterns in common iliac and prostatic arteries and to model PAE with particle tracking in a patient-specific model. A computer model of common iliac arteries and the downstream vasculature was created from CT-angiography images using SimVascular. Image-based computational fluid dynamics (CFD) simulation using Oasis (a minimally dissipative open-source solver) was performed to obtain velocity data. Finally, the Maxey Riley equation was solved to model the PAE procedure and guide embolus injection. Our patient-specific computer model can provide valuable information for the PAE procedure.

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Date submitted: 23 Jul 2019 Electronic form version 1.4