1145-VF-2351 **Ian Griffiths**, **Peter Stewart**, **Ivan Mitevski*** (ivan.mitevski@columbia.edu), **Ines Vujkovac** and **Matthew Illingworth**. *The Role of Tortuosity in Filtration Efficiency.*

Membrane fouling during particle filtration occurs through a variety of mechanisms, including internal pore clogging by contaminants, coverage of pore entrances, and deposition on the membrane surface. Each of these fouling mechanisms results in a decline in the observed flow rate over time, and the decrease in filtration efficiency can be characterized by a unique signature formed by plotting the volumetric flux, Q , as a function of the total volume of fluid processed, V.

With asymmetric multilayered filters, comprising a series of membranes with constant pore sizes stacked on top of one another, filtration can be tailored in a variety of novel ways. We develop a network model that allows for a random pore distribution within the filter, which captures the behavior of a globally connected filter in 3D. The model allows us to understand the relationship between tortuosity and efficiency, and establish when maximum efficiency can be expected, with respect to flux, and throughput.

The filter is characterized through particle size, adhesivity to the membrane, pore size, and pore distribution, which allows for sweeps in parameter space that can be conducted to determine an optimal filter configuration for a given filtration challenge. (Received September 26, 2018)