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**Flow past a confined array of rigid hairs** NATHAN JONES, SRI SAVYA TANIKELLA, EMILIE DRESSAIRE, University of California, Santa Barbara — A variety of aquatic organisms use appendages covered with arrays of hairs to capture food, smell, and move the fluid around them. At the hair level, the flow is characterized by a low Reynolds number (Re), whose value controls the transport through the array. The array acts either as a rake forcing the fluid around at low Re or small hair spacing, or as a sieve letting the fluid through at higher Re or large hair spacing. To develop sensors inspired by those biological system, we study the influence of confinement on the flow regimes through the porous structure. We investigate the flow past an array of hairs in a rectangular channel, with a developed Poiseuille flow field. Through numerical simulations, we vary the geometry of the array, the flow rate through the channel, and the confinement. We show that the transition between the rake and sieve regimes depends on the geometry of the system. To interpret our results, we consider the flow around an isolated and confined hair.

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