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Transport of a solid sphere in liquid foam NICOLAS LOUVET, OLIVIER PITOIS, FLORENCE ROUYER, Université Paris-Est, ELISE LORENCEAU, CNRS, LPMDI TEAM — In many foam applications, particles flow through the liquid network of aqueous foam made of channels and nodes. These channels named Plateau border are the junctions between three soap films and have fluid interfaces (non zero velocity). To understand the complex behaviour of this transport, we focus our experiments on a single particle flowing with the liquid through i) a single fluid channel and ii) aqueous foam. In each experiment we control the following parameters: - mobility of the fluid interfaces – average liquid velocity - aspect ratio d/d_{lim} , where d is the particle diameter and d_{lim} the maximum diameter of the sphere that can pass through the channel. We measure the velocity of individual particles. Unexpectedly, for small d/d_{lim} and mobile interfaces, the particle velocity is smaller than the average liquid velocity. To explain this result, we assume that counter flows take place in the soap films due to Marangoni flows and thus modify the boundary conditions of the liquid flow by having an upward velocity instead of a zero velocity in the corner. We are working on a model that reproduce experimental data assuming counter flow and real network geometry.

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