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Separation of micron-scale particles using helium II[1] SYLVIE FUZIER, STEVEN VAN SCIVER, NHMFL, Florida State University, NEAL KALECHOFSKY, Oxford Instruments America — Micron scale particles immersed in helium II will rapidly achieve a terminal velocity based on a balance between gravity and viscous drag with the normal fluid component. This settling velocity is proportional to the density difference between the particle and helium II and the square of the particle diameter. If one applies a vertical upward heat flux, the resulting normal fluid component velocity can counteract the settling velocity, suspending the particles or even giving them a net upward motion. Using this principle, we have built an experimental helium II counterflow channel consisting of segments of varying width such that the heat flux decreases along the channel axis. This configuration allows particles of a particular size range to be suspended and collected in different areas of the counterflow channel. First results of this separation process are presented.

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