Self-organized focusing power in insulating capillaries

When an ion beam is injected into a tapered nanometer glass capillary, the self-organized electric potential has the strength to focus the beam at the exit, similar to a lens. The transmitted ion beam is stable for several hours but then blocks suddenly. We propose a theoretical and experimental study of this focusing effect in order to enhance the stability of the transmission. The student will test some modifications on the capillary that are expected to stabilize the transmission with our numerical code. If the simulations validate the craftiness, the student will test experimentally the modified capillaries in our experimental set up. The aim is to produce stable nanosized ions beams for the realization of nano-objects or imaging at the nanometric scale.

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