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COLLISIONS OF IONS WITH INSULATOR SURFACES: CHARGING AND DISCHARGING DYNAMICS

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Abstract. The guiding of ions in keV to MeV energy range by insulator microcappilaries opens interesting perspectives such as direct injection of ions inside a living cell or formation of surface nano-structures, etc. (see e.g. ITS-LEIF news letter #4 http://www.its-leif.org/NEWSPRESS/newspress.html). We have studied the dynamic behaviour of charge deposition and beam deflection on insulators having well defined planar geometry when the exact number of charges implanted into the surface, as well as the time evolution of the beam deflection, can be monitored. Depending on temperature of the sample, surface composition and structure, discharging time constant varies by orders of magnitude, giving rise to different guiding effects in insulator microcappilaries.

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