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Interaction of slow (<5 keV/u), highly charged ions with nanostructured membranes

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We report on studies of the interaction of slow, multiply (e. g. Ar³⁺) and highly charged ions (e. g. Xe⁴⁴⁺) with silicon nitride membranes [1]. Arrays of holes are formed in thin (30 to 200 nm thick) membranes by focused ion beam drilling. Aspect ratios of holes range from 1:1 to about 5:1. Charge exchange in thin membranes is investigated as well as energy loss and foil lifetimes under ion beam exposure. We will discuss the question of capillary beam guiding [2] for high ion charge states.

Reference:

[1] T. Schenkel et al., SPIE V 4656, 10 (2002), J. Vac. Sci. Technol. B in press (2002)

[2] N. Stolterfoht, et al., Phys. Rev. Lett. 88, 133201 (2002)

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