Interdependence of Angular Distribution and Charge State of Hyper-Channeled keV Ions

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Abstract. We study both experimentally and theoretically the hyper-channeling of 180 keV $^{22}Ne^{+}$ ions transmitted through a 54 nm thick <100> Si crystal. The angular distribution has a characteristic shape for the hyper-channeled ions. The computational analysis of the correlation between the average charge state inside the crystal and the angular distribution of transmitted hyper-channeled ions shows satisfactory agreement with the experimentally derived average charge state.

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