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Developing of a RBS-Channeling system for crystallographic analysis at the 3 MV Tandetron Accelerator of IFIN-HH, Măgurele - Romania

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Ion implantation technology provides the most efficient way to insert impurities into different materials, especially materials with crystalline structure, in order to change in a controllable manner their physical, chemical or electrical properties. It is a material engineering process that allows creation of new materials, atomic mixing, metal finishing, etc. However, by implanting energetic ions into crystals, one produces many point defects in the target crystal, such as vacancies and interstitials. Thermal treatment can be performed to regenerate the crystal. The 3 MV Tandetron Accelerator at IFIN-HH has a beam-line for ion implantation and can be used as a high-energy ion industrial implanter on full-sized 225 cm² wafers. After, implantation analysis can be made to check for induced crystal damage. We have developed an RBS-Channeling analysis system to allow quality control check of implanted crystals. The system is fully-automated and it first seeks the crystal major axis and then look for defects. Studies of crystalline structure can also be performed and we can investigate crystal lattices in the bulk region.

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