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Manufacturing and Characterization of Targets in IFIN-HH: Developing an Interdisciplinary Body of Knowledge

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The target laboratory in IFIN-HH was developed to respond to the necessity of thin films ranging from tens of nanometers to a few micrometers, which are used for nuclear physics experiments at our 9MV Tandem accelerator. In order to fulfill the specific requirements, our laboratory is endowed with high quality equipment for evaporation-condensation, cold rolling, electron gun and pulsed laser deposition techniques, the latter being outsourced for the moment.
The target characteristics define its quality and represent a key element for a successful experiment. Consequently X-ray Diffraction (XRD), Atomic Force Microscopy (AFM), and Scanning Electron Microscopy/ Energy Dispersive X-ray (SEM/EDX) analyses are performed in collaboration with specialized departments from our institute.
Progress is also foreseen from the nuclear forensics laboratory, which is currently under development in our institute. It will be dedicated to identification and characterization of nuclear materials, but also non-radioactive ones with the same type of equipment integrated in a single spot. Among the complementary methods for characterization this lab shall provide in addition to those already available, we mention the high quality optical microscopy system, which we are looking forward to use starting next year. Detailed and specific information about all the aforementioned techniques is given and finally the plan for our process and performance in the new configuration is presented. It appears the manufacturing process combined with the characterization techniques offer a strong perspective for target development methods.

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