

Surface and nanoscience research prospects using ANURIB

Interactions of energetic ions with solid surfaces and interfaces have been the subject of active research for fundamental interest as well as technological applications. Further, radioactive ion implantation on surface and nano-structures adds exciting possibilities of modification and characterization in sub atomic scale. Spectroscopic study of the emitted radiations from the implanted exotic nuclei is fascinating for probing the host material as well as to explore the properties of exotic nuclei. We intensely use the beams of existing Radioactive Ion Beam Facility (RIBF) at VECC and propose to explore the research possibilities in surface and nano-science using the upcoming ANURIB facility.

ANURIB is a unique facility, which will provide stable and radioactive beams of energy from few keV to MeV. Low energy and very low energy stable ion beams can be used for shallow implantation, which is very important for modern electronic and optoelectronic device realization, while low energy radioactive probe atoms can be used to study the local structural and magnetic properties. Intermediate energy can be used for synthesis of SOI structure (silicon on insulator), and interface mixing. Similarly, depth control implantation of RIB probes can be used for the detection of defects and magnetic structures. Higher energy stable ions can also be used for ion scattering (MEIS, RBS) and ion induce X-ray/ Gamma ray emission studies. Emission channeling, photoluminescence and beta NMR are also possible using the radioactive ion beams. Research opportunities for surface and nano science using stable and radioactive beams of ANURIB will be discussed in the talk.

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