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FINAL Presentation Abstract: The Surface Modification and Characterization User Center

The Surface Modification and Characterization (SMAC) Research Center is a unique facility for the alteration and characterization of the near-surface properties of materials. It is operated by the Solid State Division at Oak Ridge National Laboratory. The SMAC Research Center is available to scientists from university, industry, government, and other institutions for basic and applied materials research. It is equipped with ion implantation accelerators which can be used to change the physical, electrical, and/or chemical properties of solids and to create unique new materials not possible with conventional "equilibrium" processing techniques. Surface modification is achieved using such techniques as ion implantation doping, ion beam mixing, low-energy ion deposition, and ion beam annealing. These ion beam based techniques are suitable for tailoring desired modifications in many different classes of materials, including metals, semiconductors, ceramics, insulators, polymers, and even biological samples. Changes in surface properties as a result of processing by these techniques can be characterized at the SMAC Research Center using ion scattering analysis, ion channeling, nuclear reaction analysis, and other surface and bulk sensitive techniques including Auger electron spectroscopy and low-energy electron diffraction. Theoretical modeling and data reduction are possible using the extensive computer services and support that are available to visiting researchers.