

B.4. Interactions of Ions with Surfaces, Thin Films, and Clusters—*U. Thumm*

During the reporting period our theoretical work focused on electronic interactions of ions with metal and insulator surfaces, thin metallic films, and with C_{60} clusters. We proceeded along two main pathways. i) For the detailed description of one-electron charge exchange and level hybridization near metal surfaces and thin films, we performed two-center close-coupling calculations. ii) We continued to develop models and computer codes that simulate the complicated many-electron interaction dynamics during the interaction of slow highly charged ions with complex targets. These processes include the capture and emission of electrons, the formation of highly unstable multiply excited ions ("hollow ions"), the relaxation of these multiply excited ions, (collective) electronic excitations of target and projectile, and effects of the coupling between electronic and nuclear degrees of freedom that are observable in projectile kinetic energy gain and deflection angle measurements.