Simulating the LSST


The science that will be derived from the LSST (from studies of weak lensing to detection of variable and moving sources) depends on a detailed knowledge of the statistical properties of the sources detected within the LSST data stream together with a careful characterization of the statistical and systematic errors. The goal of the LSST Image Simulation group is to develop detailed simulations of images for the LSST. This includes catalogs of stars and galaxies to a depth of r<28th magnitude, variable sources including high proper motion stars, asteroids, and supernovae, extended sources and potential artifacts. From these catalogs high-fidelity image simulations incorporating a multi-layer turbulent atmosphere, detailed models of the optical system for the telescope, camera and control system are derived by ray-tracing individual photons; simulating the full LSST field-of-view. We describe the development of the image and catalog simulations and their use in testing and validating the LSST data processing and science requirements.