



GEANT4 Dynamic Simulation Facility

CNL's GEANT4 Dynamic Simulation Facility (GDSF) is located at its Chalk River Laboratories. The GDSF was created to provide a platform for modelling particle physics interactions with materials, using the GEANT4 simulation package from CERN, the European Organization for Nuclear Research.

The GEANT4 Dynamic Simulation Facility provides the ability to model particle detectors prior to building them. It allows researchers to make informed decisions related to the materials used in construction, including the dimensions, and the efficiency of proposed detector designs. It also allows the ability to mediate potential problems or limitations of proposed designs prior to the purchasing of any components.

The GDSF is unique at CNL, as it allows the modeling of exotic radiation types. For example, it can be used in non-proliferation technology by modeling neutrino interactions, as well as the study of optical photon transport. The GDSF is currently extending its capabilities in partnership with a Canadian university to do stochastic simulation of neutron time dependent processes in nuclear reactors.

Currently, the GEANT4 Dynamic Simulation Facility is being used in partnership by academics, physicists, mathematicians and software developers who are involved in simulations of reactor kinetics, nuclear instrumentation and detector technology and welcomes more partnerships.

The GEANT4 Dynamic Simulation Facility welcomes partnerships in industry and universities.

The GDSF utilizes a Dell Precision T7610 workstation running Scientific Linux 6.6 (Carbon) installed on a Samsung SSD. The workstation has dual Intel Xeon hexacore CPUs which provide 24 threads and has 32 GB of available memory. The GDSF is currently configured for GEANT 4.10 which enables event level parallelization.

