

Mentor: Ivan Bazarov

Title: Study of interceptive emittance diagnostics

The project will involve understanding performance and survivability limits of interceptive diagnostics of electron beam emittance. A pair of slits allows mapping of transverse phase space (*i.e.*, coordinate and momentum) of a beam of particles. Furthermore, using properly designed slits allows accurate emittance measurement of a so called space-charge dominated beam such as we have in the new high brightness electron source presently being developed in the lab. Limitations from multiple scattering of electrons in the material of the slits and determination of maximum allowed beam power impinging on the slits will require use of simulation tools. EGS (electron gamma showers) and ANSYS (if time allows) analysis of the problem will be the core of the project. Using EGS requires familiarity with C++/Fortran/*nix OS.