

# The Beams and Applications Seminar Series

## *Optical diffraction-transition radiation interferometry and its application to beam diagnostics*

**Ralph Fiorito (University of Maryland )  
Bldg. 401, Room B2100  
Friday, June 6, 1:30 PM**

Host: John Power

Optical transition radiation (OTR) interferometry has been shown to be a useful method to measure the rms divergence and emittance of electron beams with energies in the range of 15-230 MeV. This technique is limited by two factors: particle scattering in the first foil of the interferometer and beam energy spread. These limiting factors are usually negligible for high energy beams but can be problematic for very low emittance beams and/or low energy beams. We are developing new types of interferometers to overcome both these limitations. We have designed and tested a perforated foil optical diffraction radiation (ODR)-OTR interferometer to measure the divergence of a 95 MeV electron beam and are in the process of designing a novel interferometer, which uses ODR and optical radiation from a dielectric foil, to measure both the energy spread and the divergence of the 8 MeV AWA injector. The operation of both types of interferometers will be discussed. We will also briefly describe how such devices can be used to optically map the transverse phase space of a charged particle beam.

### **For more information visit**

<http://www.aps.anl.gov/asd/physics/seminar.html>

Visitors from off-site please contact John Power  
(jp@anl.gov, 630-252-3191) to arrange for a gate pass.

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