Plans for photoelectron modeling using synrad3d

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Electron cloud generation codes such as POSINST and ECLOUD have been widely benchmarked against data in positron and proton rings, with emphasis on developing an accurate secondary emission model. Data from electron rings suggest the photoelectron model is not complete. The photoelectron model may also be important in modeling the cloud generation on components downstream of wigglers, which can produce a very high photon flux on the wall in a local region. The SYNRAD3D code will be used to benchmark a more realistic photoelectron model. SYNRAD3D includes computation of synchrotron radiation and propagation in 3D through a vacuum chamber, and the probability of reflection vs. absorption of the photon on the chamber wall is included using data from the literature. As a first step, SYNRAD3D was used to model the photon flux for the ILC damping ring assuming a round chamber, and variation of parameters such as the number of macrophotons vs. bin size, photon energy cutoff, and turning reflections on or off was studied. Preliminary work has begun to develop a photoelectron model using Retarding Field Analyzer (RFA) data. In addition, the antechamber feature in SYNRAR3D will be benchmarked. The work to date and future plans are described.