

CENTER FOR BEAM PHYSICS SEMINAR

“Beam-Beam Simulations for PEP-II”

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Friday, August 24, 2001, 10:30 AM
Albert Ghiorso Conference Room, Bldg. 71, LBNL

Abstract:

A self-consistent beam-beam code described [Y. Cai et. al., Phys. Rev. ST Accel. Beams 4 (2001)] is used to simulate various parameter sets for PEP-II. The aim is to find better operating tunes and machine parameters such as beta functions and tunes for optimizing luminosity. At the current working point, the simulated luminosity agrees with the measured luminosity within 10%. The simulation also shows that the optimum current ratio is $I_+/I_- = 2.1/1$ which is very close to the ratio when the design luminosity $3e33 \text{ cm}^{-2}\text{s}^{-1}$ was achieved. At the current working point, the simulation shows a significant increase of luminosity if the horizontal beta function in the Low Energy Ring is lowered from 50 cm to 35 cm. New working points were also studied. The machine failed to produce the higher luminosity predicted by the simulation at the symmetric tunes due to synchro-betatron resonances which are not yet included in the code. Studies were also done for a working point just above the half integer, which has not yet been tried in the machine. Comparisons between simulations and measurements will be shown.

Biographical data and research interests:

Ina Reichel studied in Germany at the Universities of Mainz and Aachen. She did her thesis work for her diploma and Ph.D. thesis at CERN working on LEP (beam-based alignment (diploma), and tails of the transverse distribution (Ph. D.)). Since 1998, she has been a postdoc at SLAC working on various issues of PEP-II. Recently she has mainly worked on beam-beam simulations.

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