



Status of HTGEN - Halo and Tail Generation

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Abstract

We present a brief description of the current status of the HTGEN task on halo and tail generation.

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1 Introduction

The objective is to develop and collect information and code on halo and tail generation relevant for linear colliders. The work is done by a small group based at CERN, consisting of the EuroTeV fellow L. Neukermans and the CERN staff member H. Burkhardt.

2 Candidate Processes

A first list of halo candidate processes has been made available in January 2005 as web page <http://hbu.home.cern.ch/hbu/HTGEN.html>. The current list is reproduced here. Particle processes:

- Beam Gas elastic scattering, multiple scattering
- Beam Gas inelastic scattering, bremsstrahlung
- Synchrotron radiation (coherent and incoherent)
- Intrabeam scattering
- Touschek scattering
- Scattering off thermal photons

Optics related:

- Mismatch
- Coupling
- Dispersion
- Non-linearities

Various, equipment related:

- Noise and vibration
- Dark currents
- Space charge effects close to source
- Wake-fields
- Beam Loading
- (Thin) Spoiler

3 Status

A new, precise and very fast synchrotron radiation spectrum generator was developed, based on direct spectrum inversion and Chebyshev polynomials and is currently being interfaced with the Geant4 program package.

This work was presented in the ILC-European Regional Meeting at Royal Holloway University of London in June 2005 [1].

The EuroTeV fellow, Lionel Neukermans, started as planned at CERN beginning of September 2005. He has a background in particle physics. His first weeks at CERN

were spent with intensive training in machine physics with emphasis on linear optics and with participation in the CAS school at the intermediate level.

We have written first simulation codes for two halo production processes, Bremsstrahlung and Mott scattering and collaborate on the interfacing of these codes with tracking programs (PLACET, MERLIN).

We have started to investigate possibilities of benchmarking of our predictions with other simulations and actual measurements. We established direct contacts to both operations (F. Tecker) and beam instrumentation experts (T. Lefevre and Carsten Welsch) working on CTF3.

We discussed and presented our work in the recent ILC Collimation meeting [2].

Acknowledgement

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References

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