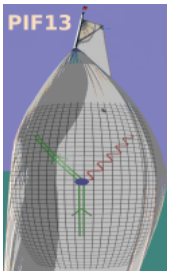

Contribution ID: **43** Type: **oral presentation**

Quantum Synchrotron Radiation Measurements using Crystals

Thursday, 11 July 2013 10:20 (20 minutes)

The classical description of synchrotron radiation fails at large Lorentz factors for relativistic electrons crossing strong transverse magnetic fields. When the Lorentz factor times the magnetic field is comparable to the so-called critical field of 4.4 GT, quantum corrections are essential for the description of synchrotron radiation. The radiation emission drastically changes character; not only in magnitude, but also in spectral shape and can only be described by quantum synchrotron radiation formulas. This has been experimentally tested with electrons of energies 10-150 GeV penetrating a germanium single crystal along the <110> axis. Apart from being a test of strong-field quantum electrodynamics, the results are also relevant for the design of future linear colliders where beamstrahlung - a closely related process - may limit the achievable luminosity.

Primary author: ANDERSEN, Kristoffer (Aarhus University)

Co-author: UGGERHOJ, Ulrik (Aarhus University)

Presenter: ANDERSEN, Kristoffer (Aarhus University)

Session Classification: Experiments and facilities