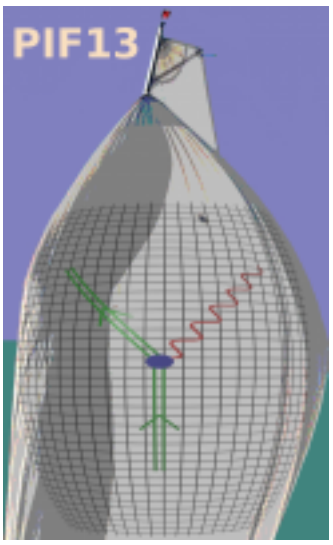
Physics in Intense Fields (PIF2013)



Tuesday, 9 July 2013 - Thursday, 11 July 2013

Bulding 1C, DESY Hamburg

Scientific Programme

The workshop sets itself to review the field of strong field physics. The field encompasses quite a spread of topics, and are listed below. The subject matter is posed as questions in some instances. The actual balance of the workshop talks will depend on the range of contributions received.

Strong field QED/QFT

Theoretical developments in QED, or more generally QFT, involving interactions with strong external fields

What are the links between QED in curved spacetime and QED in strong fields?

Strong field collider phenomenology

Calculations in strong fields present at collider interaction points

How do we perform Furry picture calculations in the intense fields of overlapping intense charge bunches at the IP of a collider?"

What is the effect on the Beamstrahlung spectrum and radiation angle of including exact solutions in the strong fields of the both colliding charge bunches at a linear collider

Ultra-intense LASERS

Studies involving strong fields from LASERS

The advent of new ultra-intense LASER facilties in Europe such as XFEL and ELI has prompted a great deal of theoretical work<\p>
LASER-plasma acceleration involves physics processes in strong intra-plasma electric fields and the strong circularly or linearly polarised fields of at least one impinging LASER

Strong fields in crystals

Theory and experiment in crystalline, inter-lattice strong fields.

Supposing one would be able to generate 4 TeV electrons from an extracted LHC beam (as under development in the AFTER@LHC project): Would the accessible region of the strong-field parameter (chi or Upsilon, usually) of the order 100 in crystals open a new regime (inspired by the classical critical field being 137 times larger than the quantum version)), or would it be merely a continuation of the behavior that is already known?

In the newly established experiment E-212 at SLAC, we aim to address the question of lasing in the MeV regime, by means of strong field interactions in crystals. Theory has so far only been developed in the case of non-relativistic transverse motion, and predicts that we will not be successful. What happens when relativistic transverse motion (which is relevant) is treated?

Is it possible to measure the process of photon splitting in the strong field regime, e.g. in crystals?"

Heavy ion collisions

Strong field physics in heavy ion collisions and/or quark-gluon plasmas

Numerical calculations and Simulations

Simulations of strong field phenomena

Axion-like physics

Schwinger mechanism

Studies involving the Schwinger mechanism

Unruh radiation

Studies involving Unruh radiation

Magnetars

Strong fields present in astrophysical objects

Other Strong field studies

Strong field studies which do not fit the above descriptions