IPAC 2011 – some highlights

- **WEPC102**: *Recent developments for efficient 3D space charge computations based on adaptive multigrid discretizations*, by G. Pöplau et al.
  - In GPT (”General Particle Tracer”, *www.pulsar.nl/gpt*): space-charge effects calculated thanks to ”Particle-mesh” model.
  - Usually, mesh is constructed according to the charge density.
  - Pb for hard-edged bunches → high field gradient near the edges, which require more mesh lines.
  - Recently, new idea: self-adaptive mesh based on multigrid, i.e. refined step by step thanks to a certain criterion (τ-criterion).

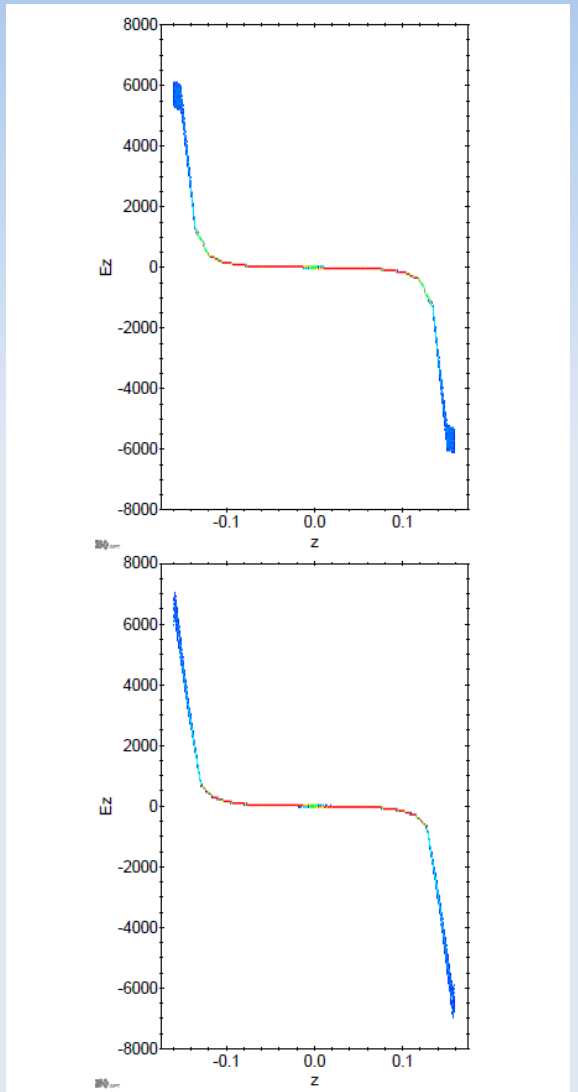

Figure 2: Longitudinal field of a long bunch with aspect ratio $10^{-2.5}$ obtained with the GPT mesh (top) and with the adaptive multigrid mesh (bottom).

IPAC 2011 – some highlights

- **WEPZ012**: *Influence of transition radiation on formation of a bunch wakefield in a circular waveguide*, by T. Y. Alekhina and A. V. Tyukhtin
  - Analytical and numerical study of the wake fields created by a moving particle in a circular waveguide filled by two different dielectrics (i.e. the particle comes e.g. from vacuum and go into a dielectric, or vice-versa). Cherenkov and transition radiations calculated. Useful for dielectric acceleration techniques.

- **WEPC043**: *Beam transport in a dielectric wall accelerator for intensity modulated proton therapy,* by Y.-J. Chen et al
  - Acceleration and focusing at the same time, thanks to wake fields.

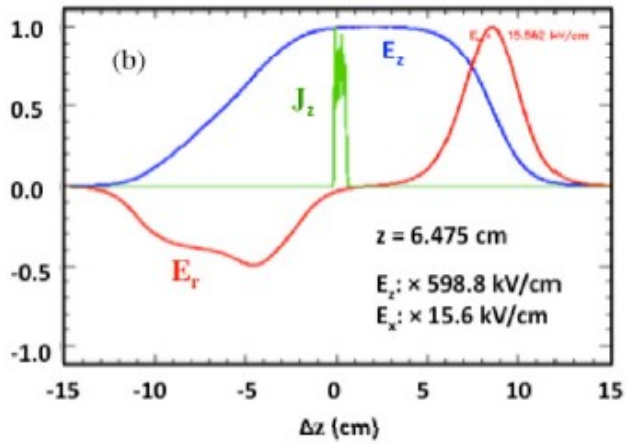

Figure 4: The longitudinal and radial electric field profiles of (a) a strong electric focusing DWA lens at the DWA entrance (z = -2.55 cm) and (b) constant acceleration inside the DWA (z = 6.475 cm) and proton current profiles.

IPAC 2011 – some highlights

- **THPZ030**: *Halo scrapings with collimators in the LHC*, by F. Burkart et al (CERN collimation team)
  - Scraping with the primary collimators → loss rates at the BLM → total lost intensity → transverse distribution of the beam.
  - The measured loss rates depend on the scraping speed.
  - The distribution obtained is best fitted with a double Gaussian:

$$I_{fit}(u) = I_1\left(1 - e^{\frac{-(u-\mu)^2}{2\sigma_1^2}}\right) + I_2\left(1 - e^{\frac{-(u-\mu)^2}{2\sigma_2^2}}\right)$$

Could give access to a better knowledge of the Landau damping stability diagram.