

GFA & SwissFEL Accelerator Seminar

AWAKE, the Advanced Proton Driven Plasma Wakefield Acceleration Experiment at CERN

Monday, 13 April 2015, 16.00 h, WBGB/019

Edda Gschwendtner, CERN

The Advanced Proton Driven Plasma Wakefield Acceleration Experiment (AWAKE) is a proof-of-principle R&D experiment at CERN. It is the world's first proton driven plasma wakefield acceleration experiment, using a high-energy proton bunch to drive a plasma wakefield for electron beam acceleration. The AWAKE experiment will be installed in the former CNRS facility, CERN Neutrinos to Gran Sasso, and uses the 400 GeV proton beam bunches from the CERN SPS, which will be sent to a plasma source. The first experiments will focus on the self-modulation instability of the long (~ 12 cm, rms) proton bunch in the plasma. This instability is used to transform the incoming bunch into a train of short bunches with a period approximately equal to the plasma wavelength, ~ 1.2 mm at a nominal plasma electron density of $7e14/cm^3$. These experiments are planned for the end of 2016. Later, low energy (~ 15 MeV) electrons will be externally injected to sample the wakefields and be accelerated beyond 1 GeV.

This seminar gives an overview of the project, shows the goals of the experiment and describes the main activities and the progress.

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AWAKE Experimental Layout

