

Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

The AWAKE Proton-driven Plasma Wakefield Acceleration Experiment at CERN PATRIC MUGGLI, Max Planck Institute for Physics, AWAKE COLLABORATION — We are planning an experiment at CERN to accelerate externally injected electrons e^- on the wake driven by a long, self-modulated proton p^+ bunch. In the plan the 12cm-long bunch from the SPS with 10^{11} p^+ experiences a two-stream transverse instability that modulates the bunch radius at the plasma wake period. The bunch is focused to $200\mu m$ into a plasma with density in the $10^{14} - 10^{15}cm^{-3}$ range. The modulation instability is seeded by co-propagating with the p^+ bunch a short laser pulse that ionizes a gas or vapor. The modulation resonantly drives wakefields to large amplitude. The low energy e^- ($\approx 5 - 20MeV$) produced by a rf-photoinjector gun are injected after the instability has saturated, $\approx 3 - 5m$ into the plasma and is accelerated to the GeV energy range. The e^- energy spectrum is measured by a large energy acceptance magnetic spectrometer. Bunch modulation diagnostics such as time resolved OTR and electro-optic measurements are also included. The general plans for the experiment as well as the latest developments will be presented.

Patric Muggli
Max Planck Institute for Physics

Date submitted: 13 Jul 2012

Electronic form version 1.4