



Canadian Association  
of Physicists

Association canadienne  
des physiciens et physiciennes

Contribution ID: 3220

Type: **Invited Speaker** / **Conférencier(ère) invité(e)**

## (I) Proton Driven Plasma Wakefield Acceleration Experiment at CERN

*Tuesday, 7 June 2022 15:40 (25 minutes)*

Acceleration of particle beams by induced wakefield in plasmas is a possible solution on a path to push the energy frontier of experimental high energy physics by constructing compact machines with acceleration rates in excess of GV/m. The Advanced Wakefield Experiment (AWAKE), a plasma wakefield acceleration experiment, driven by the 400 GeV proton beam from the CERN SPS synchrotron is unique among plasma wakefield acceleration projects in its selection of protons as the driving particles. The efficiency and reach of energy transfer from 400 GeV protons to electrons confer a clear advantage over electron or laser driven alternatives. The AWAKE collaboration, including a team from Canada, was formed in 2013 as a proof-of-principle experiment and has already produced a wealth of results. The Run 1 of the experiment yielded the discovery of Self-Modulation of the SPS proton bunch in plasmas and acceleration of externally injected electrons to the GeV energy level. Starting in 2021 the experiment has proceeded with a decade-long Run 2 program. The goals for the Run 2 are the stable acceleration of a quality electron beam with high gradients over long distances and proof of scalability of the design principles to very high beam energies. This will allow the AWAKE collaboration to contemplate first applications of the experimental scheme to high-energy physics.

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**Session Classification:** T4-3 New Directions in Accelerator-Based Experiments: Future Experiments  
- From Collider to neutrinos (PPD) | Nouvelles voies fondées sur des accélérateurs: expériences futures  
- de collisionneur à neutrinos (PPD)

**Track Classification:** Symposia Day (Tues. June 7) / Journée de symposiums (mardi, le 7 juin):  
Symposia Day (PPD) - New Directions in Accelerator-Based Experiments