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## **AWAKE: proton driven plasma wakefield acceleration for particle physics applications [BALLROOM]**

*Thursday, 25 July 2024 09:00 (30 minutes)*

AWAKE is a proton-driven plasma wakefield acceleration experiment at CERN. Proton drivers provided by the CERN accelerators carry a large amount of energy per bunch (~20kJ) and per particle (~400 GeV), sufficient to excite GV/m fields over tens to hundreds of meters in a single plasma. Drivers are initially much longer than the plasma wavelength and must be self-modulated to resonantly excite high amplitude wakefields. In this contribution, we present an overview of recent AWAKE experimental results on: the observation of motion of ions and the filamentation instability using a 10m-long discharge plasma source; the demonstration of wakefield reproducibility when self-modulation is seeded; the suppression of self-modulation with a linear plasma density gradient as well as results of the effect of a plasma density step in the self-modulation plasma. Further, we describe AWAKE's plan towards application of this acceleration scheme to particle physics.

### **Working group**

invited speaker

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**Session Classification:** Plenary