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Status of the proton and electron transfer lines for the AWAKE experiment at CERN

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The AWAKE project at CERN is planned to study proton driven plasma wakefield acceleration of an externally injected electron beam. The CNGS extraction line will be modified to provide the plasma cell with a proton beam from the CERN SPS. A new transfer line was designed to transport the electrons from an RF gun to the cell. The commissioning of the proton line will take place in 2016 for the first phase of the experiment, which is focused on the study of the self-modulation of the proton bunch in the plasma. A co-propagating laser beam will be used to seed and control this process. The electron line will be added for the second phase of AWAKE in 2017, when the wakefield will be probed with an electron beam. The challenge for these transfer lines lies in the parallel operation of the proton, electron and laser beam. These beams, with different characteristics, need to be synchronised and aligned to optimize the injection conditions. This task requires great flexibilities in the transfer line optics, as well as special designs for the beam instrumentation and the electron line magnets. The status of theses design will be presented in this paper.

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