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Studies of an ultra-short bunch injector for AWAKE RUN2

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The proton driven plasma wake-field experiment AWAKE at CERN aims to demonstrate electron acceleration with a long electron bunch in a first series of experiments. After the long shutdown of LHC a second phase for AWAKE is planned starting 2021 called RUN2. In this phase the aim is to demonstrate the acceleration of high quality electron beams therefore a bunch length of the order of 100 fs rms is required corresponding to a fraction of the plasma wavelength. The AWAKE collaboration is studying the design of such an injector either based on classical RF-gun injectors or on laser wake-field acceleration. The focus for the RF accelerator is on a hybrid design using an S-band RF-gun and x-band bunching and acceleration cavities. The status of these studies will be presented.

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