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Capturing an RF Photo-Electron Bunch in a Laser Plasma Wakefield

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RF photoguns are an appealing source for injecting electrons into a plasma wake because they can produce extremely high brightness beams. In order to capture a large percentage of the beam, we find that it is necessary to pre-bunch the beam close to the plasma frequency. We determine the plasma parameters necessary to capture and accelerate electrons from a table-top sized RF beamline such as that at UCLA's PEGASUS facility. Bunch dynamics are confirmed by particle tracking.

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