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**Laser acceleration with self-injection: a test experiment
for the FLAME sub-PW laser.**

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Abstract

The installation at LNF of the 0.3 PW, Ti:Sa laser system FLAME (Frascati Laser for Acceleration and Multidisciplinary Experiments) is now in an advanced stage and commissioning is expected to be completed by the end of 2010. Parallel to the laser installation, an experiment is being designed and set up to study electron acceleration at the sub GeV energy level exploiting self-injection laser-driven electron plasma waves. We describe the acceleration mechanism as predicted by numerical simulations and discuss the key input laser and target parameters also in view of the control of the quality of the accelerated electron bunches.