

Generation of picosecond pulsed ions using ultrafast electrons

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Ultrafast physics is a rapidly advancing field where high-resolution measurements in time and space offer unparalleled insight into the structure and dynamics of materials.

We introduce a novel technique that utilizes ultrafast electrons to generate pulsed ions via desorption. Utilizing these short ion pulses to explore new, time-resolved processes in materials is designed to examine ultrafast phenomena that are currently beyond the reach of conventional pump-probe measurements using pulsed electrons and lasers.

Our experimental setup features a femtosecond UV laser beam that triggers ultrashort electron pulses from a lanthanum-hexaboride cathode. The pulsed electrons are guided towards a metallic plate where pulsed ions are generated. Proton pulses of $\sim\sigma = 200$ ps are measured with an MCP assembly.