

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Influence of the ion mass on quantum electrodynamics processes with the next generation high power lasers¹ REMI CAPDESSUS, PAUL MCKENNA, Department of Physics SUPA, University of Strathclyde, STRATHCLYDE INTENSE LASER INTERACTIONS STUDIES GROUP TEAM — The construction of a number of new multi-petawatt laser facilities in Europe, USA and China has generated intense interest in the exploration of new physical regimes involving ultra-strong electromagnetic fields in which a significant amount of the laser energy is converted into high energy synchrotron radiation and in which electron-positron pairs can be produced. These new laser facilities will enable experimental exploration of this science for the first time. From an ultra-intense laser pulse ($I \sim 10^{23}$ W/cm²) interacting with a plasma, we bring out the impact of the ion collective dynamics on the basic quantum electrodynamics processes such as high energy synchrotron radiation generation and the production of electron-positron pairs in the non-linear Breit-Wheeler process. Relevant cases are qualitatively discussed as well as potential future experiments.

¹This work is supported by EPSRC (Grant No. EP/P007082/1)

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Date submitted: 21 Jul 2017

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