

Lorenzo Giuffrida, Ph.D.

Senior Researcher Department of Ion Acceleration and Applications of High Energy

Particles (Dep. 87)

Fyzikální ústav AV ČR, v.v.i./ ELI Beamlines

Za Radnicí 835

252 41 Dolní Břežany

Czech Republic

Prague

May 18th, 2022

Supervisor's Report of the Master Thesis by Arsenios Hadjikyriacou titled "Laser-driven ion acceleration: analysis and theoretical interpretation of experimental data"

The Thesis titled "Laser-driven ion acceleration: analysis and theoretical interpretation of experimental data", prepared by the student Arsenios Hadjikyriacou, is focused on the analysis and theoretical interpretation of experimental data from the basic commissioning experiment at the ELIMAIA beamline using the HAPLS PW laser system available at the ELI beamlines facility located in Dolní Břežany.

The Student was strongly involved in the analysis of data coming from ion diagnostics used during the experimental campaign (mainly Thomson Parabola spectrometer and TOF based diagnostics), useful to characterize the laser-driven proton sources in term of energy cutoff and flux. He was also involved in a series of Particle In Cells PIC simulations useful to understand the role of laser pre-pulses during the interaction and made a preliminary interpretation of the experimental achievements.

During the Master Thesis the student has been involved in different activities:

1. Study of literature about the topic;
2. Study of the main ion diagnostics useful for the characterization of the ion sources;
3. Use and development of tools for the ion diagnostic analysis;
4. PIC simulations for pre-plasma evaluation;
5. Interpretation of PIC simulation results according to experimental feedbacks.

All these activities have been completed and are reported in the Master Thesis in an excellent way. To note that some of these results will be used in a publication in a peer reviewed journal, currently in preparation.

During the two years under my supervision, the student has demonstrated that he is able to study and solve problems in an independent way. He has improved the way of managing discussions and presentations. He has also become more confident and dynamic.

The Thesis includes four chapters, an introduction, and a conclusion section, where the student has illustrated the main topics with a good detail level.

At the end of the thesis, a satisfying list of references about the topic is also included.

In general, the Thesis is written in a good English, understandable by any possible reader. Although the student at the moment is not completely independent and needs actual laboratory experience and more practice in the simulation side, I believe that he has good potentialities for the future if he would decide to continue with a PhD.

For the above reasons, as Supervisor, I would propose the maximum assessment, A (výborně), to the Thesis.

Lorenzo Giuffrida, Ph.D.