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Compact Thomson Parabola Spectrometer for Fast Diagnostics of Different Intensity Laser-Generated Plasmas

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A compact Thomson parabola spectrometer for diagnostics of laser-generated plasma was built in Messina University to be employed in different experiments. It allows to detect the charge particles emitted from hot and fast plasma separating them per charge state, energy and mass-to-charge ratio. Moreover, it is possible to detect electrons emitted from plasma. It uses a double pin-hole input for alignment direction, a permanent magnet (0.004 - 4 kG) and an electric field (0.05 - 5 kV/cm) both orthogonal to the direction of the incident particles, and different type of planar detectors (multi-channel plates, phosphorous screen, gaf-chromix, CR39 and PM 355 track detectors). Measurements were acquired at MIFT in Messina observing electrons up to 10 keV kinetic energy, at INFN-LNS of Catania using ions emitted from plasma submitted to a post acceleration up to 30 kV per charge state and at PALS laboratory in Prague detecting energetic ions above 1 MeV per charge state.

The particle recognition was obtained comparing experimental parabola curves with theoretical simulations obtained using COMSOL software. Results will be presented and discussed.

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