Contribution ID: **86** Type: **Oral contribution**

# Quasi monochromatic Carbon beams acceleration in the peeler setup

*Tuesday, 15 April 2025 15:40 (20 minutes)*

In the peeler scheme the laser pulse is incident on the narrow edge of a tape-like target. The generated surface plasma wave accelerates the electrons peeled from the lateral surface of the target, thus generating an high-charge electron bunch that creates a large amplitude accelerating field for positive ions residing the in the target rear, allowing for the generation of quasi-mochromatic proton beams [1,2].

In this study, we discuss the applicability of the peeler scheme for a quasi-monochromatic acceleration of ions such as carbon, too. So far, the application of the peeler scheme for the acceleration of ions from carbon layers resulted in an exponentially decreasing spectrum [2]. In the new proposed scheme, an engineered carbon structure with tuned spatial extent and density is placed at the target rear. By using 3D-PIC simulations which employ a realistic multi-PW laser pulses like the ones available at ELI-NP, we demonstrate that quasi monochromatic C-beams with 10% FWHM energy spread and about $10^9$ ions can be obtained [3]. Finally, an experimental demonstration of the scheme with the granted beamtime at ELI-NP/1PW in September will be discussed.

[1] Phys.Rev.X 11, 041002(2021)
[2] PPCF 65, 034005 (2023).
[3] B. Corobean et al., TBS

**Primary authors:** PUKHOV, Alexander (uni duesseldorf); Mr COROBEAN, Bogdan (Univ. Politechnica Bucharest & ELI-NP); UR, Calin Alexandru (ELI-NP); DORIA, Domenico (ELI-NP, HH-IFIN, QUB); D'HUMIERES, Emmanuel (CELIA, univ. Bordeaux); TOMASSINI, Paolo (ELI-NP and CNR-INO); Dr HORNY, Vojtech (ELI-NP, Romania)

**Presenter:** TOMASSINI, Paolo (ELI-NP and CNR-INO)

**Session Classification:** Parallel Session

**Track Classification:** Ion acceleration