ID contributo: **323** Tipo: **Poster (student)**

Parametric study of low-divergence X-rays from a laser-plasma-lens

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Betatron radiation from laser wakefield accelerators is a powerful X-ray source, proven useful in several applications, e.g. in medical imaging and tomography, X-ray absorption spectroscopy for warm dense matter among others. However, due to the large X-ray divergence typically on the order of tens of mrad, an effective beam transport to the sample and subsequent detection becomes challenging which limits the signal to noise ratio. In a previous study [1], we showed that the X-ray divergence can be significantly reduced by utilising a passive plasma lens, here consisting of a gas ionised by the drive laser itself. As the accelerated electrons propagate through this second plasma they generate strong transverse fields, which focuses the beam and produces bright X-rays. In this work, a detailed study of the X-ray lens radiation is performed, looking at the plasma parameters themselves, such as drift space and density atomic composition, and electron beam properties.

[1] J Björklund Svensson, J., Guénot, D., Ferri, J. et al. Low-divergence femtosecond X-ray pulses from a passive plasma lens. Nat. Phys. 17, 639–645 (2021). https://doi.org/10.1038/s41567-020-01158-z

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