

MAX-PLANCK-INSTITUT FÜR PHYSIK



IFAST

EUROPEAN NETWORK FOR NOVEL ACCELERATORS

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Abstract

We study experimentally hosing [1] of a long proton bunch in plasma. We induce this process with misalignment between the trajectories of a preceding short electron bunch and that of the proton bunch. We observe hosing as transverse oscillation of the proton bunch centroid position in the plane of misalignment at the period of the wakefields. Self-modulation (SM) occurs in the perpendicular plane. The two processes (hosing and SM) are reproducible from event to event. Misalignment to the opposite sides with respect to the given bunch axis leads to the oscillations being in counter phase. The amplitude of oscillation increases with the proton bunch charge [2] and is also affected by the extent of misalignment. We will present the latest experimental results.







Summary

- p^+-e^- aligned $\rightarrow eSSM$
- p^+-e^- misaligned \rightarrow induced f_{pe} -hosing (plane of misalignment) + eSSM (\perp plane) \rightarrow reproducible!
- Vary Q_p , n_{pe} and $L_{misalign} \rightarrow$ study dependency Data acquisition and analysis ongoing

[1] D. Whittum et al., Phys. Rev. Lett. **67**, 991 (1991) [2] C. Schroeder et al., Phys. Plasmas **20**, 056704 (2013) ACKNOWLEDGEMENT - This poster presentation has received support from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 101004730.