

# Kinetic evolution of an ultrashort electron or positron bunch travelling through an overdense plasma

F. Tanjia<sup>1</sup>, R. Fedele<sup>2</sup>, S. De Nicola<sup>3</sup>, D. Jovanović<sup>4</sup>

<sup>1</sup> Independent University Bangladesh, Dhaka, Bangladesh

<sup>2</sup> Dipartimento di Fisica, Università di Napoli "Federico II", Napoli, Italy

<sup>3</sup> CNR-SPIN, Complesso Universitario di Monte S'Angelo, Napoli, Italy

<sup>4</sup> Institute of Physics, Belgrade, Serbia

The Vlasov- Poisson-like system of equations, governing the self consistent plasma wake field generation of an ultrashort electron or positron bunch in an overdense plasma, is analyzed. The linear dispersion relation is derived in order to show the occurrence of the beam instability.