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Quantum regime in new collider configurations THOMAS GRISMAYER, MARIJA VRANIC, FABRIZIO DEL GAUDIO, GoLP/Instituto de Plasmas e Fusao Nuclear, Universidade de Lisboa, RICARDO FONSECA, DCTI/ISCTE Instituto Universitario de Lisboa, LUIS SILVA, GoLP/Instituto de Plasmas e Fusao Nuclear, Universidade de Lisboa — The increasingly successful development of plasma accelerators suggests that tabletop devices will deliver high-energy electron/positron beams, reaching tens of GeV and high densities, in the near future. It is possible to capitalize on this technology to probe quantum effects in two scenarios: colliding the particle beams themselves or colliding the beam with an intense laser. We revisit the pioneering work, that addressed TeV beams [1], and we show that it is a feasible setup to produce collimated gamma rays and pairs [2] with GeV beams. The second scenario allows to explore the radiation-dominated regime and to predict signatures for both classical [3] and quantum radiation reaction [4] in the laboratory: we demonstrate the key beam signatures to be probed in future experiments. These studies are supported by analytical predictions that are in full agreement with the simulations performed with multidimensional QED simulations with the OSIRIS framework. [1] P. Chen and V. I Telnov, Phys. Rev. Lett. 63, 1796 (1989). [2] F. Del Gaudio et al, to be submitted (2017) [3] M. Vranic et. al, Phys. Rev. Lett. 113, 134801 (2014). [4] M. Vranic et. al, New J. Phys, 18, 073035 (2016)

Thomas Grismayer
GoLP/Instituto de Plasmas e Fusao Nuclear, Univ. de Lisboa

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