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High intensity laser driven sources of gammas and positrons using BELLA PW Laser Dual Beamlines

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Recent commissioning of the second laser pulse transport line at the BELLA PW facility enables strong-field quantum electrodynamics (SF-QED) experiments where an intense laser pulse collides with a GeV-class laser-wakefield-accelerated electron beam. An overview of the upgraded BELLA PW facility with a SF-QED experimental layout is presented. According to the simulation results these experiments can lead to the generation of an efficient source of high energy gammas and positrons via Compton and Breit-Wheeler processes as well as enable the study of the transition of the laser-particle interactions from the classical to the SF-QED regime.

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