# High-current well-directed relativistic electron beams for multidisciplinary research

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High-current well-directed relativistic electron beam is an excellent tool for applications in many research fields such as plasma physics, nuclear physics, biology, cancer therapy, material science, etc. Pilot experiments performed at PHELIX-facility in Darmstadt as well as particle-in-cell and Monte-Carlo simulations demonstrated strong increase of particle and photon fluence in interaction of relativistic laser pulse with long-scale plasma of near critical density [1, 2].
In the presentation, current experimental results on electron, gamma and neutron generation as well as future experiments on applications in plasma physics and biophysics will be discussed.
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[1] Rosmej O N, Andreev N E, Zaehter S *et al* 2019 *New J. Phys.* **21** 043044
[2] Rosmej O N, Gyrdymov M, Günther M M *et al* 2020 *Plasma Phys. Controlled Fusion* **62** 115024