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# On the route for detecting vacuum birefringence at an XFEL combined with a PW-class laser

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Vacuum birefringence as a clear variant of light-by-light scattering is a feasible experiment at an XFEL combined with a PW-class laser. Such experiment would measure the birefringence of vacuum − induced by the giant electromagnetic field in the focus of the PW laser − directly by ultra-sensitive X-ray polarimetry. In this way, the effect depends on real photons of externally controllable beams, complementary to other effects where photon-photon couplings are in play.

The HIBEF user consortium at the European XFEL is aiming for such experiment. We will give a status update on the progress made in recent beamtimes, concerning a) the polarimeter extinction for a well-collimated (laser-like) X-ray beam, b) the X-ray optics to be used inside the polarimeter, c) self-seeded operation of the XFEL and d) assuring best focusing/intensity verification.