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LUX Electron Beam Optic

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The LUX experiment, built and operated by the University of Hamburg in close cooperation with DESY, produces laser-plasma electron bunches with 5 Hz repetition and is currently upgraded towards the generation of undulator radiation. Here, we present a beam optic for electron energies of 100-400 MeV with a modified, compact electro quadrupole doublet. The magnets feature a gap size as small as 12 mm, resulting in field gradients of up to 150 T/m, which allows capturing the beam 10cm behind the target and focusing it into a 5mm period undulator or an electron spectrometer, respectively. Special care was taken in the beam pipe design to ensure clip-free laser transport to the post target diagnostics. Based on this beam optics we will present our concepts to longitudinal phase space diagnostics using transition radiation.

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