

Four channel low power coherent beam combining set-up in the frame of the XCELS project

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Our work presents a four-channel prototype of a system for geometric convergence and coherent combining of tightly focused femtosecond laser beams in counter propagating geometry. During the interference of the individual laser channels in the main focus of the system occurs a standing laser field configuration close in its structure to the dipole focusing underlying the design of the exawatt XCELS project [1]. The prototype uses radiation from a pulsed femtosecond laser source operating at a repetition rate of about 80 MHz without additional amplification inside the laser chain. The two-stage system for stabilizing the laser radiation direction at the input of the prototype set-up, as well as the phase stabilizing system for four beams were developed and tested.

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