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Towards MeV energy gains in dielectric laser accelerators

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We report on the status of the next generation DLA experiments at the UCLA Pegasus laboratory. These experiments, carried out in the framework of the ACHIP collaboration will use a newly commissioned 40 mJ laser system and take full advantage of the capabilities to manipulate nearly arbitrarily the phase and amplitude of a laser wave with liquid crystal phase mask technology. We show how injecting a high brightness relativistic beam from the UCLA Pegasus laboratory into a cm-long dielectric double-grating dielectric structure, it could be possible to shape the drive laser to obtain stable focusing and acceleration of the electrons in the channel with a net energy gain exceeding 1 MeV.

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