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Proton and ion beams generated with a CO2 laser[1] IGOR POGORELSKY, VITALY YAKIMENKO, IGOR PAVLISHIN, DANIIL STOLYAROV, BNL, PETER SHKOLNIKOV, Stony Brook SUNY University, ALEXANDER PUKHOV, Inst. Theor. Physic I, Duesseldorf, PAUL MCKEANA, University of Strathclyde, Glasgow, ZULFIKAR NAJMUDIN, LOUISE WILLINGALE, Imperial College, London, ELENA STOLYAROVA, GEORGE FLYNN, Columbia University, New York — The proton- and ion generation experiment is initiated at the BNL's ATF where thin-foil targets are irradiated by a 1-TW, picosecond CO2 laser. A particle beam is produced in the normal direction to the foil's rare surface. A spectrometer equipped with CR-39 dosimetry plates reveals proton- and ion spectra in the sub-MeV energy range. Comparison with results of previous experiments that used solid-state lasers allows for verification of wavelength scaling of the ion- and proton laser acceleration. We present simulations that lead the way toward further up-scaling of proton beam energy and luminocity in order to answer the demand for compact proton sources and injectors for scientific, medical and industrial applications.

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