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The computer simulation of laser proton acceleration for hadron therapy[1] VLADIMIR LYKOV, GRIGORY BAYDIN, RFNC-VNIITF, THE ISTC PROJECT 2289 TEAM — The ions acceleration by intensive ultra-short laser pulses has interest in views of them possible applications for proton radiography, production of medical isotopes and hadron therapy. The 3D relativistic PIC-code *LegoLPI* is developed at RFNC-VNIITF for modeling of intensive laser interaction with plasma. The *LegoLPI*-code simulations were carried out to find the optimal conditions for generation of proton beams with parameters necessary for hadrons therapy. The performed simulations show that optimal for it may be two-layer foil of aluminum and polyethylene with thickness 100 nm and 50 nm accordingly. The maximum efficiency of laser energy transformation into 200 MeV protons is achieved on irradiating these foils by 30 fs laser pulse with intensity about $2{\cdot}10^{22}$ W/cm^2. The conclusion is made that lasers with peak power about 0.5-1PW and average power 0.5-1 kW are needed for generation of proton beams with parameters necessary for proton therapy.

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