Abstract Submitted
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Repetitive tabletop plasma focus to produce a tunable damage factor on materials for fusion reactors[1] LEOPOLDO SOTO, CRISTIAN PAVEZ, MARIA JOSE INESTROSA-IZURIETA, JOSE MORENO, SERGIO DAVIS, BISWAJIT BORA, GONZALO AVARIA, Comision Chilena de Energia Nuclear, Santiago, Chile, JALAJ JAIN, Universidad de Talca, LUIS ALTAMIRANO, Dicontek, MIGUEL PANIZO, RAQUEL GONZALEZ, ANTONIO RIVERA, Instituto de Fusin Nuclear, U. Politcnica de Madrid, Spain — Future thermonuclear reactors, both magnetic and inertial confinement approaches, need materials capable of withstanding the extreme radiation and heat loads expected from high repetition rate plasma. A damage factor ($F=q\tau^{1/2}$) in the order of 10^4 $(W/cm^2)s^{1/2}$ is expected. The axial plasma dynamics after the pinch in a tabletop plasma focus of hundred joules, PF-400J, was characterized by means of pulsed optical refractive diagnostics. The energy, interaction time and power flux of the plasma burst interacting with targets was obtained. Results show a high dependence of the damage factor with the distance from the anode top where the sample is located. A tunable damage factor in the range 10- $10^5(W/cm^2)s^{1/2}$ can be obtained. At present the PF-400J operating at 0.077 Hz is being used to study the effects of fusion-relevant pulses on material target, including nanostructured materials. A new tabletop device to be operated up to 1Hz including tunable damage factor has been designed and is being constructed, thus thousand cumulative shots on materials could be obtained in few minutes. The scaling of the damage factor for plasma foci operating at different energies is discussed.

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