

Abstract Submitted  
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**Influence of Initial Conditions On Discharge-Pumped XUV Laser Beam.**<sup>1</sup> JIRI SCHMIDT, KAREL KOLACEK, JAROSLAV STRAUS, OLEK-SANDR FROLOV, Institute of Plasma Physics of the CAS — This work reports on recent results of the experimental device CAPEX working as an XUV laser source that is pumped by a fast capillary discharge. On this device we observed lasing at 46.9 nm (Ne-like Ar line). The initial conditions (such as pre-pulse current amplitude and duration, filling argon pressure in the capillary) play a key role on the laser beam characteristics (e.g. on the laser beam profile, and on the laser pulse energy). The external pre-pulse driver operates independently on the main capillary current. The pre-pulse current amplitude can be varied in the range from 5 A up to hundreds of A, and its duration (the pre-pulse beginning to the main current onset) can be adjusted from 3 ns up to hundreds of ns. We have found a significant influence of these initial conditions on the laser beam profile and on the laser pulse energy. Of course, the initial pressure of argon inside the capillary has a substantial effect on the laser beam as well. These measurements have been performed for three groups of the main capillary current amplitudes (~12 kA, ~19 kA, ~26 kA). In summary, this paper gives a systematic survey of laser beam profiles and laser pulse energies in dependence on capillary-discharge initial conditions varying in much broader ranges than ever before.

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