Influence of Initial Conditions On Discharge-Pumped XUV Laser Beam.\textsuperscript{1} JIRI SCHMIDT, KAREL KOLACEK, JAROSLAV STRAUS, OLEKSANDR 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 ?s up to hundreds of ?s. 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 (\textasciitilde 12 kA, \textasciitilde 19 kA, \textasciitilde 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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