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Discharge-pumped XUV source.[1] JIRI SCHMIDT, KAREL KOLACEK, JAROSLAV STRAUS, OLEKSANDR FROLOV, Institute of Plasma Physics of the CAS — We have built two experimental devices (CAPEX and CAPEX-U) working as XUV sources, which are based on the fast, pinching capillary discharge. On both these devices we have observed lasing at 46.9 nm (Ne-like Ar line). However, besides lasing at the above mentioned relatively long wavelength, they are also used for testing a possibility of amplification at the wavelengths below 20 nm that have more practical applications. Particularly, at present nitrogen-filled capillary (?4 mm x 90 mm) discharge is studied for the development of XUV (soft X-ray) laser based on recombination pumping scheme: the fully stripped nitrogen nuclei recombine to hydrogen-like atoms, where Balmer-alpha transition (wavelength 13.4 nm) is - according to theoretical predictions - capable of creating population inversion. The modified electrical parameters (peak current ˜60 kA with quarter period of ˜45 ns) meet the necessary theoretical conditions. The only question remains, if suitable pre-pulse can suppress the capillary-wall-ablation, which in all presently known cases has quashed the amplification. In this paper the recent results obtained from both these discharge systems (argon-, nitrogen-filled capillaries) will be presented.

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