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Improvement of copper vapor laser characteristics by zinc additive YURIJ SHPENIK, VOLODYMYR KELMAN, YURIJ ZHMENYAK, Institute of Electron Physics NAS Ukraine — The influence of Zn atom additive on "pure" copper vapor laser output characteristics was studied. Two-section discharge tube (DT) with an external heated Zn reservoir placed at the center between ceramic sections with Cu pieces was elaborated. The pulsed periodical longitudinal discharge was excited in the DT with Cu-Zn-Ne admixture by a traditional circuit using thyratron generator with resonant overcharge of a storage capacitor. Experimental investigations established that the width, energy and power of laser pulses increased when Zn atoms at appropriate temperature $\sim$ 500 °C of zinc containing reservoir diffuse into discharge. The registered increasing of pulse energy was up to 50% comparatively with the energy without additive with peak energy at $\sim$ 600 °C. Additional absorption experiments and modeling the absorption of Zn atom resonant line in the DT (taking into account Doppler and dispersion line broadening) consistent with the conclusion that not only optical resonant pumping by 213.9 nm Zn atom line, but other processes also might be taken into account to explain the influence effects (second kind collisions between resonance state zinc and metastable copper state atoms).

Yurij Shpenik
Institute of Electron Physics NAS Ukraine

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