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High power (50MW), pulsed, broadband (50%) microwave amplifier[1] I.L. BOGDANKEVICH, E.B. GORODNITCHEV, I.E. IVANOV, O.T. LOZA, V.P. MARKOV, A.V. PONOMAREV, P.S. STRELKOV, D.K. ULYANOV, General Physics Institute, RAS, Moscow, E.P. GARATE, University of California, Irvine — The first time operation of a coherent, broadband microwave amplifier with an output power of 80 MW and amplification of 36 dB over a frequency range from 2 to 3 GHz has been demonstrated. The amplifier is based on the Cherenkov mechanism of interaction between electrons and plasma and converts the kinetic energy of a relativistic electron beam (500 keV, 2 kA) into microwave energy. The radiation frequency is determined by the plasma density which can be varied over a wide range resulting in the broad frequency tunability of the device. The microwave signal is delivered to the amplifier entrance by a coaxial cable and the amplified radiation exits the device as a TE11 mode of a circular waveguide. Experimental results showed that the phase difference of the signals at the amplifier entrance and exit are fixed, i.e. the waves are coherent between 2 and 3 GHz. Details of the complete system and the experimental results will be presented.

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