APERTURE CALORIMETER WITH OPTICAL SENSOR FOR MEASUREMENT THE HIGH POWER MICROWAVE PULSE ENERGY

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The calorimeters like [*Vykhodtsev P.V., Elchaninov A.A., Klimov A.I. et al. // Instrum. Exp. Tech. – 2015. – V. 58. –No4. – P. 510.*] with a disk-shaped three-layer wide-aperture dummy loads filled with alcohol-based working liquid are used for measurement high power microwave pulses energy [*Benford J., Swegle J.A., Shamilogl E. High Power Microwaves. – New York–London: Taylor& Francis, 2007.*].

In the present work a calorimeter had been developed and investigated analogous to [*Vykhodtsev P.V., Elchaninov A.A., Klimov A.I. et al. // Instrum. Exp. Tech. – 2015. – V. 58. –No4. – P. 510.*] in which an optical sensor with transparent capillary tube is used for the measurement the liquid volume increase due to microwave energy absorption. A linear LED packages aligned along the tube produce light flux of red color across the capillary. A TLS1412S charge-coupled line imaging device 98 mm long with 400 dpi resolution was used as a sensor of the light flux passed through the tube. Read off the signal from the device, the data processing and controlling the liquid-air interface is effectuated by a controlling system and especially developed software. The system controls the liquid meniscus position in the capillary tube by means of automatically regulation the liquid heater power supply.

The calorimeter is calibrated like in [*Vykhodtsev P.V., Elchaninov A.A., Klimov A.I. et al. // Instrum. Exp. Tech. – 2015. – V. 58. –No4. – P. 510.*]. Accomplish this, the microprocessor generates controlling signal of variable length to control the power supply of the calibrator.

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