

DIFFRACTION OF NANOSECOND ELECTROMAGNETIC PULSES AT DISK-SHAPED WIDE-APERTURE DUMMY LOADS OF LIQUID MICROWAVE CALORIMETERS

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Results are presented of S-band numerical simulation with the PiC code KARAT [Tarakanov V.P. *User's Manual for Code Karat*. – Berkley: Springfield, 1992.] of nanosecond high power microwave pulses [Benford J., Swegle J.A., Shamiloglu E. *High Power Microwaves*. – New York–London: Taylor & Francis, 2007.] diffraction by disk-shaped wide-aperture dummy loads of liquid calorimeters [Vykhodtsev P.V., Elchaninov A.A., Klimov A.I. et al. // *Instrum. Exp. Tech.* – 2015. – V. 58. – No 4. – P. 510.] as applied to typical experimental conditions like [Kitsanov S.A., Korovin S.D., Klimov A.I. et al. // *Tech. Phys. Lett.* – 2004. – V. 30. – No 8. – P. 619.]. The simulation results show that the microwave pulse envelope behind the load is formed due to microwave diffraction by the load rather than to microwave flow directly through the load layers.

It is also demonstrated that under typical experimental conditions, the microwave energy can be underestimated by 10–20 % when measured by the calorimeter with its disk-shaped load immediately ahead of the aperture of the transmitting conical horn antenna [Kitsanov S.A., Korovin S.D., Klimov A.I. et al. // *Tech. Phys. Lett.* – 2004. – V. 30. – No 8. – P. 619.]. Measuring circuits are proposed to reduce the underestimate of microwave energy and to provide more accurate measurements of the pulse envelope.

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