

Calorimetric system for high-precision determination of activity of the ^{51}Cr neutrino source in experiment BEST

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Experimental studies of neutrino nonstandard properties using high-intensity artificial neutrino sources require a high accuracy of the source activity determination. The calorimetric method using mass flow calorimeter was chosen in the BEST project for measuring the activity of intense neutrino source based on ^{51}Cr with activity of about 3M Ci. The performed calibration of a prototype of the calorimetric system demonstrated that the uncertainty of the measurement of heat release was less than 0.25% in the interval of source heat power 270-700 W. The results obtained in the calibration taking into account the uncertainty of the energy release in the ^{51}Cr decay (0.23%) showed that the activity of the neutrino source based on ^{51}Cr can be determined with an accuracy of about 0.5%. On the basis of the results the calorimetric system was designed and manufactured for measuring the activity of the artificial neutrino source in experiment BEST.

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