

## Standardization of Critical Temperature Measurement Using ac Susceptometer

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For determination of critical temperature, resistive method and magnetization measurement have been generally used. The resistive method is more often than magnetization measurement used to define the critical temperature because the measurement is simple. If the specimen is composed of inhomogeneous grains or, the spaces between their grains are insulated, the resistive method can not be applied to measure the critical temperature.

In addition to the resistive method, the magnetization measurement is also a significant and fair method to evaluate the quality of a superconductor for both manufacturer and user. We have studied the magnetization measurement using an ac susceptometer for providing a standard method. The ac susceptibility as a function of temperature with different amplitude and frequency of the applied field was studied to characterize the critical temperature for NbTi, Nb<sub>3</sub>Sn and Bi-2223 composite wires.

We studied magnetization-temperature curves with different amplitude from 2 Oe to 20 Oe. The frequency dependence of magnetization-temperature curves also studied to standardization of measurement. The amplitude of applied field from 2 Oe to 10 Oe with frequency below 100 Hz is suitable for the critical temperature measurement. For a definition of the resistive method, the critical temperature was determined as the mid-point of the resistive transition from the normal state to the superconducting state. In a magnetic method, the mid-point definition can not be applicable because the magnetic signal does not always approach a perfect diamagnetic line.

keywords : composite superconductor, critical temperature, standardization, ac susceptibility