

Role of Ac Transverse Magnetic Field on the Magnetization of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_8$ Single Crystal

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We have studied the ac transverse magnetic field on the magnetization of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_8$ single crystal. The crystal was mounted on a Hall sensor and positioned at the center of a solenoid that can generate a small magnetic field. The magnetization of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_8$ single crystal has been measured in a dc magnetic field applied along the crystalline c axis and ac field applied parallel to the ab plane. The coil current was varied from 0 to 30 mA and the ac frequency was varied from 0 to 3 kHz. The measurement was performed in dc magnetic fields up to 2.5 kG and temperature range from 16 to 30 K. The results showed that the magnetization decreases monotonically with the increasing ac field. On the other hand, the frequency dependence revealed non-monotonic dependence on frequency showing the smallest irreversible magnetization around 100 Hz. The implication of this work will be discussed in detail.

keywords : magnetization, transverse magnetic field