

## Characterization of 2G Superconductor Magnetic Shields at 40–77 K

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**Abstract** - Magnetic shielding properties of second generation (2G)  $\text{YBa}_2\text{Cu}_3\text{O}_7$  superconducting tape were characterized in the temperature range of 40-77 K. Description of the apparatus that enabled variable temperature shielding property measurements is presented. Temperature stability of  $\pm 1$  K was achieved using a combination of conductive thermal anchor of the shields to the cryocooler cold head and helium gas environment. Lower temperatures resulted in significant enhancement in shielding properties. Shielding factors of up to 95% were achieved for both DC and AC magnetic fields by using shields consisting of multiple layers of 2G tape in sheet and coil configurations. Effect of frequency, temperature and number of layers on the shielding efficacy is presented.

**Index Terms** - AC magnetic field, Hall probe, magnetic shielding, shielding factor, variable temperature measurements, 2G coil, 2G sheet,  $\text{YBa}_2\text{Cu}_3\text{O}_7$  superconducting tape.

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