A Fast-Reversed DC Measurement with a Josephson Voltage Source

Ac-dc transfer difference due to thermoelectric effects in a thermal converter was evaluated using a NbN/TiN/NbN Josephson junction array as an ultra-stable Fast-Reversed DC (FRDC) source. The Josephson junction array was connected in parallel with a conventional semiconductor FRDC current source, as an "add-on" voltage-stabilizer for the input of the thermal converter. The ac-dc difference due to thermoelectric effects was evaluated with standard measurement (type-A) uncertainty of the order of 0.01 µV/V, four-times better than that for the conventional semiconductor FRDC source.

Hitoshi SASAKI
Nano-electronics Institute
e-mail: hitoshi-sasaki@aist.go.jp