Optimization of Detection Unit of AC/DC High-T$_c$ SQUID Magnetometer for Evaluation of Magnetic Nanoparticles in Solution

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Abstract — We have optimized the detection unit of the previously developed AC/DC high-T$_c$ SQUID magnetometer and evaluated the magnetic properties of magnetic nanoparticles in solution. A compensation coil technique was used in the fabrication of the detection coil to reduce the interference of the excitation magnetic field. This technique had resulted in a single detection coil using one SQUID for AC and DC magnetization measurement functions and reduced the spatial limitation of the sample shape. The small compensation coil was manually tuned to reduce the interference. Improved sensitivity for evaluation of magnetic nanoparticles can be expected using this technique.