Method for Detecting Partial Discharge of Ground Coil from the Vehicle

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In the superconducting maglev systems, an enormous number of ground coils: propulsion coils and levitation-guidance coils are installed over the whole lines in a guide way. High voltage is applied to the propulsion coils during the passage of maglev trains. Partial discharge (PD) is a symptom of insulation degradation of the propulsion coils; PD detection from the maglev vehicle that is traveling leads to effective maintenance and management of the propulsion coils. This paper describes the configurations of an antenna-array of a radio interferometer system for PD detection mounted on the maglev vehicle, simulation results for propagation of electromagnetic waves from a PD source, and experimental results by setting the antenna-array on the side of and in the maglev vehicle. It was confirmed that PD sources can be detected by the antenna-array of radio interferometer system set in the maglev vehicle.