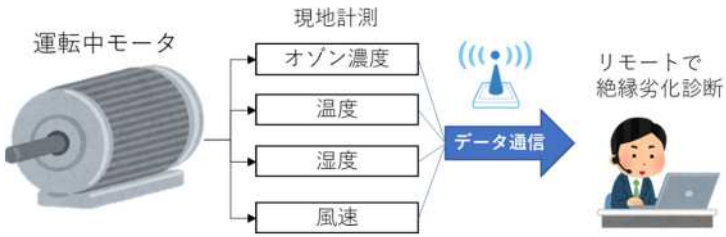


Name FURUSATO Tomohiro	Job Title Associate Professor	Area of Expertise High Voltage Pulsed Power Engineering
1. Main Research Topics Our laboratory specializes in high voltage, plasma, and pulsed power. These technologies are applied across cross-disciplinary fields—including electric power and energy, electronics, the environment, agriculture, food, and medicine—and contribute to the creation of new industrial applications. Our research covers both the active use of discharge plasmas (e.g., wastewater treatment) and the prevention of discharge plasma initiation (high-voltage insulation). For generating discharge plasmas, we are equipped with pulsed-power supplies that temporally compress energy and release it in short bursts, as well as AC high-voltage sources for insulation studies, enabling us to produce discharge plasmas under a wide range of conditions. Below are some of our laboratory's research themes." ① Basic research on water treatment by surface discharge plasma on water using pulsed power Water pollution from industrial effluents and domestic wastewater leads to severe environmental degradation, making the development of water purification technologies essential for a sustainable society. Our laboratory is working to improve water quality by generating ‘artificial lightning’ (discharge plasma) on the water surface using high-voltage and pulsed-power techniques. Because no chemical additives are used, this approach is attracting attention as an environmentally friendly technology.  ② Insulation degradation diagnosis technology for industrial motor At present, large industrial motors (hundreds of kilowatts or more) used in equipment such as pumps, compressors, and fans at power plants, petrochemical plants, and steelworks ensure safety through periodic teardown inspections. However, because disassembly is costly and time-consuming, there is a strong demand for convenient inspection methods that do not require disassembly. In this research, we are developing an online insulation-degradation diagnostic system that utilizes ozone concentration corrected for environmental factors. (Japanese Patent No. 7560367) 		
2. Keywords Discharge plasma, pulsed power, high voltage, insulation diagnosis		
3. Remarks and Websites Key Features & Research Achievements ➤ Development of wastewater purification technology using water-surface discharge plasma generated by pulsed power ➤ Development of high-voltage insulation diagnostic technology for large industrial motors via ozone monitoring (Japanese Patent No. 7560367) ➤ Insulation design for power semiconductor devices Prospects ➤ Pursue research on the decomposition and sequestration (fixation) of CO₂ using discharge plasmas. ➤ Advance insulation diagnostics by leveraging data science (AI). researchmap: https://researchmap.jp/furusato/ Laboratory: https://pulsep.eee.nagasaki-u.ac.jp/		