

Machine Learning for Process Monitoring and Control of Low-temperature Plasmas

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Recent breakthroughs in machine learning and artificial intelligence enabled by advances in computing power and parallel computing present key cross-disciplinary research opportunities to strengthen the core of low-temperature plasma (LTP) science and technology. Machine learning holds promise to transform the current practice in modeling and simulation, diagnostics, and process control of LTPs interacting with complex surfaces in applications such as plasma medicine, plasma catalysis, or plasma-based materials processing. In this talk, we will give a brief overview of the recent advances in this area. In particular, the potential capabilities of data analytics and machine learning will be discussed using several machine learning applications for process diagnosis and monitoring, online process optimization, and reinforcement learning of an atmospheric-pressure plasma jet. We envision that machine learning will become indispensable for addressing major science and technological challenges in LTPs in the years ahead.