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Developments of Control System for Ion Source Using Machine Learning

In the ion source, various factors such as the plasma state, the current of the beam transport electromagnet, etc. influence each other. Therefore, when operating the ion source, it is necessary to adjust various parameters such as RF power, gas flow, current of the electromagnet on the beamline, etc. each time. At present, it is difficult to control the plasma state accurately, and this adjustment is based on operator's experience. With this adjustment method, beam intensity, quality, and adjustment time depend operator and reproducibility is low. Therefore, we developed a new control system using machine learning. We aim to control ion sources and transport beam lines with good reproducibility by using machine learning, which can handle huge amounts of data. In this presentation, we will present the current status of development of control system using machine learning.

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