PiAI Seminar Series: Physics informed AI in Plasma Science
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Web Seminar

Real-time sensing of laser ablation plasma using machine learning

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In recent years, the development of high-repetition lasers has progressed, and plasma experiments using high-repetition lasers will be frequently used in near future. In plasma experiments with high-repetition lasers, in-situ observation is required to instantly grasp the laser irradiation conditions and plasma state. However, it is not realistic to precisely measure the state and distribution of plasma in real time. Therefore, we are trying to infer the detailed distribution of plasma from the limited measurement data and simulation data obtained in the experiment.

The first attempt at developing in-situ observations is to establish a method for inferring states from simulation results by machine learning. In this study, a different material is inserted into the base target to be irradiated with the laser. We try to determine the initial state of the different substance from the distribution of the ablated plasma using machine learning analysis.

In the near future, we will assimilate experiment data in this system and attempt to develop the in-situ observation system with high-repetition laser experiment.