

# Development of System Design Code for Heliotron Reactor

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Heliotron reactors inherently have suitable properties for a DEMO reactor; no need of current drive power, easiness in steady state operation. Thus it is quite meaningful to clarify a possible path to the DEMO reactor with utilizing such properties of heliotron reactors.

Sensitivity analysis with wide range of design parameters is an effective way to clarify the design direction of a reactor system. Heliotron reactors, however, have high degree of freedom in its design and require the consideration of complicated three-dimensional effects. Then fast calculation with simple formulae is difficult. Whereas, according to the past design study, design regime suitable for a DEMO reactor has been narrowed down. In such a restricted area, we can obtain good perspectives of the reactor performance with several empirical scalings or approximation formulae. Of course it is also important to consider several detailed elements (e.g., the location of poloidal coils, equilibrium magnetic field structure, etc.) to ensure the design feasibility of a reactor system. In this presentation, we will discuss about the current situation of the development and some critical issues about such system design code for heliotron reactors.