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Overview of Diagnostic design for burning plasma experimental superconducting tokamak

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This talk presents the progress in the design of the diagnostic system for the burning plasma experimental superconducting tokamak. Different from present diagnostics, new requirements and challenges arising from burning plasma for diagnostics have been investigated first. These specifications facilitate establishing criteria for measurement identification and technique selection. A comprehensive workflow is then outlined to clarify the design steps. Given the harsh environment and limited port resources, a compact and robust diagnostic system is envisioned. The measurements for nuclear safety and machine protection, plasma operation control, and fusion physics understanding are proposed, and 28 candidate systems and techniques are selected for burning plama experimental superconducting device. Key R&D challenges, such as the high neutron radiation environment and advanced diagnostic port integration, are identified. Additionally, the development of new diagnostic techniques and synthetic diagnostics is discussed. Finally, the talk concludes by outlining future wok.

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