

Plasma formation and sustainment without a central solenoid in a Spherical Tokamak

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Obtaining the plasma current in any ST is a challenge as there is limited space for the central solenoid; indeed this must be absent in an ST Power Plant due to the high neutron flux (there being no space for an effective shield). However the design and the equilibrium properties of an ST lend themselves to novel techniques both for obtaining an initial current, and for ramping it up to the operational value. A range of such techniques will be described, with special emphasis on the Merging-Compression method of plasma formation used on MAST, and the effectiveness of NBI heating. The important role played by the vertical field in an ST will be discussed, and demonstrated by results from MAST.

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