

Abstract Submitted
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Overview of SPARC on the high-field path to fusion energy¹ DAN BRUNNER, Commonwealth Fusion Systems, SPARC TEAM — The SPARC mission is to create and confine a plasma that produces net fusion energy for the first time. High-temperature, high-field superconductors comprise the fundamental technology that enables SPARC to be built at a relatively small scale compared to other proposed net-energy tokamaks; the smaller scale enables it to be completed on a faster timeline. The two major milestones of the 3-year Phase 1 of the project to be completed in June 2021 are (1) design, construction, and operation of a SPARC-relevant toroidal field model coil and (2) a ready-to-construct engineering design of the SPARC tokamak and facility. The first year of R&D was very successful, proving the robust performance of superconducting cables under SPARC-relevant conditions. The team has moved on to designing and preparing to construct the toroidal field model coil, which will retire most of the major integrated risks of the SPARC magnet system. In parallel, the physics and engineering design of the SPARC device has been progressing to a self-consistent “V1” design in which all major systems have a robust margin to engineering limits.

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