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Conceptual Design of a 2-Channel Steady-State ECH Launcher for KSTAR

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KSTAR will add a new 2-channel steady-state Electron Cyclotron Heating (ECH) launcher to its existing pair of launchers, providing 4MW of steady-state ECH power for heating and current drive.

This launcher is designed specifically for steady-state operation. Advanced features, such as fast steering with real-time position feedback for stabilization of neoclassical tearing modes, are included. Additive manufacturing is used for several components.

In this paper, the conceptual design of the 2-channel steady-state launcher is presented. Evolution of the design, starting from the original KSTAR ECH launchers, is summarized. The effect of emerging technologies, such as additive manufacturing, on the engineering of critical launcher components, is discussed.

Prototypes of some launcher components, including the mirrors, are now being fabricated. These components are described, and the results of initial testing are discussed.

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