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Wed-Af-Po.01-03: Canis: 3x3 array of sub-scale planar coils for the Eos stellarator

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The “Canis” 3x3 array of high-temperature superconductor (HTS) planar coils was designed, manufactured, and tested by Thea Energy, Inc to demonstrate the viability of its core technology to generate stellarator magnetic fields for “Eos”, the company’s first integrated fusion system. The Canis 3x3 magnet array demonstrated the ability to create complex magnetic field shapes with sufficiently small field error for stellarator operation tolerant to minor variations in individual coil performance and build. The coil set consists of nine winding packs, five double pancakes soldered in series, each with a maximum in-bore field of 1.7 T at 20 K and a minimum charge rate of 5 A/min. Details of the mounting and connection schemes will be presented. This work details the coil array design and field-shaping performance along with the cooling and electrical structures.

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