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Characterization of Expected Operating Conditions of the HIDRA Stellarator with EMC3-EIRENE STEVEN MARCINKO, DAVIDE CURRELI, Univ of Illinois - Urbana, HIDRA TEAM — The HIDRA stellarator (formerly WEGA) at the University of Illinois at Urbana-Champaign has begun operation in partially-ionized conditions. Using the coupled EMC3-EIRENE code the 3D edge plasma region may be self-consistently simulated including the effects of neutrals and impurities. By including Bohm-like cross-field diffusivity into EMC3, valid for classical stellarator designs like HIDRA, a preliminary consideration of expected operating conditions in HIDRAs magnetic geometry may be presented. Axial magnetic field strengths between 87.5 mT and 0.5 T are considered with whole-device power levels scanned from 26 kW to 250 kW. An ITER-sized divertor tile is considered as a limiter positioned around the five-fold symmetry of the device with inboard, outboard, and 'trench' poloidal orientations. Divertor-relevant materials including carbon, lithium, and molybdenum have been simulated. Particle and energy confinement times, impurity and neutral energy sinks, and resulting particle and heat fluxes incident on potential limiter geometries are presented.

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