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Improvements to Plasma Modeling and Hardware Systems for Spectroscopic Analysis on HIDRA[1] MATTHEW PARSONS, ELIZABETH PEREZ, DANIEL ANDRUCZYK, University of Illinois at Urbana-Champaign — The HIDRA stellarator/tokamak facility at the University of Illinois at Urbana-Champaign is dedicated to the development of novel materials technologies for fusion reactors. The machine is equipped with a pair of optical spectrometers for the analysis of plasma characteristics, and a pair of infrared cameras for the monitoring and analysis of plasma-limiting components. Extensive work has been done in the past year to improve both the modeling and hardware aspects of these systems. A Collisional-Radiative Model is now employed to reconstruct 1-D profiles of plasma densities and temperatures from line-integrated measurements with the optical spectrometers. The infrared camera data can be compared to recent work on the modeling of HIDRA plasmas for the analysis of heat fluxes to limiting surfaces. On the hardware side, significant modifications to the original infrared optical system allow for the cameras to be placed outside of the magnetic field, and further permits the interchange of lenses to vary the viewable area inside of HIDRA.

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