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Plasma diagnostic development and UHV testing for the ALPHA collaboration at Marquette University T. D. THARP, Marquette University, ALPHA COLLABORATION — At Marquette, we are developing the next generation of nonneutral plasma diagnostics for the ALPHA experiment at CERN. ALPHA is building a new vertical experiment to test the gravitational interaction of antihydrogen with Earth. This expansion requires significant changes to the design of our plasma diagnostic suites: the next generation of tools must be able to measure plasmas from two directions, and must be capable of operating in a horizontal position. The diagnostic suite includes measurements of plasma density, shape, and temperature. The hardware used includes a MicroChannel Plate (MCP), a Faraday Cup, and an electron gun. In addition, we are building a vacuum chamber to test the viability of 3-d printed components for UHV compatibility, with target pressures of 10^{-10} mbar.

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