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Extreme ultraviolet and Soft X-ray diagnostic upgrade on the HBT-EP tokamak: Progress and Results[1] S. DESANTO, J.P. LEVESQUE, A. BATTEY, J.W. BROOKS, M.E. MAUEL, G.A. NAVRATIL, Columbia University, C.J. HANSEN, University of Washington — In order to understand internal MHD mode structure in a tokamak plasma, it is helpful to understand temperature and density fluctuations within that plasma. In the HBT-EP tokamak, the plasma emits bremsstrahlung radiation in the extreme ultraviolet (EUV) and soft x-ray (SXR) regimes, and the emitted power is primarily related to electron density and temperature. This radiation is detected by photodiode arrays located at several different angular positions near the plasmas edge, each array making several views through a poloidal slice of plasma. From these measurements a 2-d emissivity profile of that slice can be reconstructed with tomographic algorithms. This profile cannot directly tell us whether the emissivity is due to electron density, temperature, line emission, or charge recombination; however, when combined with information from other diagnostics, it can provide strong evidence of the type of internal mode or modes depending on the temporal-spatial context. We present ongoing progress and results on the installation of a new system that will eventually consist of four arrays of 16 views each and a separate two-color, 16-chord tangential system, which will provide an improved understanding of the internal structure of HBT-EP plasmas.

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