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Two-dimensional Electron Temperature Measurements Using Soft X-Ray Emission on the Compact Toroidal Hybrid[1] J.L. HERFINDAL, G.J. HARTWELL, S.F. KNOWLTON, D.A. MAURER, Auburn University — Electron temperature measurements are important in characterizing the equilibrium as well as MHD fluctuations in fusion plasmas. The Compact Toroidal Hybrid (CTH; $R_0 = 0.75\,\mathrm{m}$, $a_p \sim 0.2\,\mathrm{m}$, B$\leq 0.7\,\mathrm{T}$, $n_e \leq 5$ x $10^{19}\,\mathrm{m}^{-3}$, $I_p \leq 80\,\mathrm{kA}$, $T_e \leq 200$ eV) torsatron has an extensive collection of emissivity diagnostics: four pinhole type cameras, a bolometer, a spectrometer, and a prototype two-color camera. Improvements have been made on the current prototype two-color camera to reduce the electronic noise and ensure a light-tight camera housing. Amplifiers with a bandwidth of approximately 40 kHz have been implemented for study of both equilibrium and electron temperature fluctuations due to low frequency MHD activity. Electron temperature estimates from the SXR spectrometer, two-color camera, and conductivity measurements are compared. Two additional two-color cameras are currently under construction and will enable the tomographic reconstruction of the electron temperature.

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