

Abstract Submitted
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Vacuum Magnetic Field Mapping in the Compact Toroidal Hybrid¹ J.T. PETERSON, G.J. HARTWELL, S.F. KNOWLTON, R.F. KELLY, C. MONTGOMERY, Auburn University — The Compact Toroidal Hybrid (CTH) is a recently completed, five field-period, low aspect ratio ($R/a_{PLASMA} \geq 3.5$, $R = 0.75$ m, $a_{VESSEL} = 0.29$ m, $B \leq 0.6$ T) torsatron with a highly flexible vacuum magnetic field configuration for stability studies. Electron beam field-mapping evaluation of the vacuum field configuration is now underway with a movable gun and phosphor-coated screen. These experiments compare the actual magnetic configuration with the design field, verify the planned flexibility and the range of accessible magnetic configurations, and identify and correct vacuum field errors. The main helical field is produced by a continuously-wound helical coil, and the vacuum rotational transform is varied with a set of toroidal field coils. Four independent poloidal field coil sets provide equilibrium control and shaping, and are also used for ohmic current drive. A set of 15 error correction coils addresses the issues of static magnetic islands and break-up of the outermost flux surfaces by small field errors.

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