

Abstract Submitted
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An Overview of Research and Design Activities at CTFusion D.A.

SUTHERLAND, T.R. JARBOE, A.C. HOSSACK, CTFusion — CTFusion, a newly formed company dedicated to the development of compact, toroidal fusion energy, is a spin-off from the University of Washington that will build upon the successes of the HIT-SI research program. The mission of the company is to develop net-gain fusion power cores that will serve as the heart of economical fusion power plants or radioactive-waste destroying burner reactors. The overarching vision and development plan of the company will be presented, along with a detailed justification and design for our next device, the HIT-TD (**T**echnology **D**emonstration) prototype. By externally driving the edge current and imposing non-axisymmetric magnetic perturbations, HIT-TD should demonstrate the sustainment of stable spheromak configurations with Imposed-Dynamo Current Drive (IDCD), as was accomplished in the HIT-SI device, with higher current gains and temperatures than previously possible. HIT-TD, if successful, will be an instrumental step along this path to economical fusion energy, and will serve as the stepping stone to our **P**roof-**O**f-**P**rinciple device (HIT-PoP). Beyond the implications of higher performance, sustained spheromaks for fusion applications, the HIT-TD platform will provide a unique system to observe plasma self-organizational phenomena of interest for other fusion devices, and astrophysical systems as well. Lastly, preliminary nuclear engineering design simulations with the MCNP6 code of the HIT-FNSF (**F**usion **N**uclear **S**cience **F**acility) device will be presented.

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