

Project Proposal

Team:

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Proposal:

Create an analytical and computational model for single particle motion in a Stellarator.

Area of E&M:

Magnetohydrodynamics, Lorentz Force, Maxwell's Equations

Possible Sources:

There is a lot of history in the field of nuclear fusion. We'll mostly be drawing on literature in the field about the Stellarator reactor to build our analytical model, and we'll simplify our analytical model to create our computational one.

The Physics of Fluids 1, 253 (1958); doi: 10.1063/1.1705883

The Physics of Fluids 10, 2653 (1967); doi: 10.1063/1.1762089

Phys. Plasmas 26, 082504 (2019); doi: 10.1063/1.5098761

What has been done, what are we doing:

Only one Stellarator has been built before, in 2015. The physics for building one is well understood, but we want to construct and understand why the magnetic fields are built in such a weird shape, and model how the plasma moves through these fields.