

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Magnetic nulls in interacting dipolar fields¹ TODD ELDER, ALLEN BOOZER, Columbia University — Magnetic nulls make the behavior of field lines subtle even for simple curl-free magnetic fields. This behavior must be understood before magnetic reconnection can be. We examine nulls through the interaction of two magnetic dipoles embedded in perfectly conducting hollow spheres, one with a much stronger dipole moment than the other. The dipole moments are oriented at an arbitrary angle. Two magnetic nulls arise generically about the weaker dipole. Field lines near the nulls are of four topological types: lines that leave and enter the sphere of the weaker dipole, lines that either leave or enter the weaker dipole, and lines that never strike the weaker dipole. The relation of the properties near each point null, which involves spines and fans, and the global topological properties are determined.

¹This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Fusion Energy Sciences under Award DE-FG02-95ER54333

Todd Elder
Columbia University

Date submitted: 02 Jul 2019

Electronic form version 1.4