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# DEFINITIONS OF TWIST, WRITHE, AND ABSOLUTE HELICITY IN SIMPLY CONNECTED VOLUMES

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## ABSTRACT

Quantities like twist and writhe are local building blocks of the global invariants linking number and helicity. They are readily defined when working in Cartesian or spherical geometries. In less symmetric geometries some complications arise. The talk will describe how the poloidal-toroidal representation of vector fields in spherical geometries can be generalized [1]. We foliate space into nested simply connected surfaces. If these surfaces lack spherical symmetry then the poloidal field acquires a shape term which arises from variation in curvature. We can then employ the shape term in defining absolute definitions of helicity, which describe how toroidal and poloidal components wrap about each other.

*Joint work with Gunnar Hornig.*

[1] Berger, M.A. and Hornig, G. 2018, A generalized poloidal–toroidal decomposition and an absolute measure of helicity. *J. Phys. A: Math. Theor.* **51** 495501.