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Peter Spaeth* (spaeth@psu.edu), Penn State University, Altoona, 3000 Ivyside Park, Altoona, PA 16601. *The helicity invariant and topological strictly contact dynamics.*

If X is a divergence-free vector field on a closed 3-manifold M equipped with a volume form μ , then the 2-form $\iota_X \mu$ is closed. Assuming it is exact, one may choose a primitive 1-form β_X and define the helicity of X to be the real number

$$\text{Helicity}(X) = \int_M \beta_X \wedge d\beta_X.$$

In a joint project with S. Müller, we compute the helicity of a vector field X that preserves a regular contact form α on M in terms of the basic contact Hamiltonian H that generates X . This provides a simple criterion for a loop of α -preserving diffeomorphisms to be non-contractible.

Combined with results from C^0 -symplectic and contact topology this computation also allows us to extend the helicity to certain measure preserving isotopies of *homeomorphisms* of M . (Received August 01, 2013)