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**Jason Cantarella** and **Jason Parsley\*** (parslerj@wfu.edu). *New perspectives on helicity.*

We realize helicity as an integral over the configuration space of 2 points on a domain in Euclidean space. We extend this framework to define submanifold helicities: differential  $(k + 1)$ -forms on  $n$ -dimensional subdomains of  $R^m$ . This topological approach also produces a general formula for how much helicity changes when the form is pushed forward by a diffeomorphism of the domain. We classify the helicity-preserving diffeomorphisms on a given domain, finding new ones on the two-holed solid torus and proving that there are no new ones on the standard solid torus. (Received September 22, 2010)