

## EXTERIOR CALCULUS IN THE IMAGE OF ODD FORMS WITH THE ORIENTATION CONGRUENT ALGEBRA

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*For Elaine Yaw in honor of friendship*

ABSTRACT. *Odd (twisted)* differential forms are naturally endowed with two transversely-oriented parts: a generalized sign and magnitude. On oriented manifolds, odd forms may be reduced to *even* ones. Also, W.L. Burke has modeled odd forms with an unnatural two-part structure. Neither approach suffices if odd forms are pulled back between manifolds with an odd difference in dimensions. Then the new *native exterior calculus* and *orientation congruent (OC) algebra* (a Clifford-like, noncommutative Jordan algebra) must be used to resolve Burke's dilemma: altering the natural orientation rule for either pullback or integration. I review the work of K. Warnick et al. on electromagnetic boundary conditions and G. Marmo et al. on the apparently inconsistent parities of electromagnetic quantities due to space-time vs. space orientations.

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Received by the editors May 31, 2008.

2000 *Mathematics Subject Classification*. Primary 58A10; Secondary 15A66, 15A75, 15A78, 17A15, 17D99, 20N05, 35F15, 35Q60, 51A05, 51N15.

For some relief from my duties at the East Lansing Food Coop, I thank my coworkers Lindsay Demaray, Liz Kersjes, and Connie Perkins, nee Summers.