998-58-308 **Igor Prokhorenkov** (`i.prokhorenkov@tcu.edu`), Department of Mathematics, TCU Box 298900, Fort Worth, TX 76129, and **Ken Richardson*** (`k.richardson@tcu.edu`), Department of Mathematics, TCU Box 298900, Fort Worth, TX 76129. *Deformations of Dirac Operators.*

We study the problem of computing the index of a Dirac operator D by understanding how the index of a perturbed Dirac operator $D_s = D + sZ$ localizes to the singular set of the zeroth order operator Z in the semi-classical limit $s \to \infty$. We use Witten's method to compute the index of D by doing a combinatorial computation involving local data at the nondegenerate singular points of the operator Z. Finally, we investigate generalizations of this procedure to the equivariant setting. Given a compact Lie group G that acts by isometries on a Riemannian manifold M, there are naturally defined transversally elliptic differential operators that resemble Dirac operators. Using the deformation technique, it is possible to calculate the equivariant index of such operators in terms of local data near the singular set of a zeroth order, equivariant operator. (Received March 01, 2004)