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The Baum-Douglas isomorphism of geometric and analytic K-homology provides a setting in which the Atiyah-Singer index theorem can be extended to certain differential operators which are Fredholm but not elliptic. The talk will explain how this point of view can be applied to solve the index problem for a naturally arising class of differential operators (on closed contact manifolds) which are Fredholm but not elliptic. This is joint work with Erik van Erp.