

ABSTRACT. The η -invariant has been defined for C^∞ -manifolds by M.F. Atiyah, V.K. Patodi and I.M. Singer, and more recently for manifolds with corners by A. Hassell, R. Mazzeo and R.B. Melrose, and for stratified PL manifolds by H. Moscovici and F.B. Wu. In the present work, this invariant is generalized in the framework of lipschitz riemannian manifolds. This involves selfadjoint extensions of the signature operator on a lipschitz manifold with boundary, and measurable differential forms which represent the Pontryagyn classes of the manifold. This allows us to extend from smooth to topological manifolds the Atiyah-Patodi-Singer index theorem for flat bundles.