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Adeniran Adeboye* (aadeboye@howard.edu), Department of Mathematics, Howard University, Washington, DC 20059. *A (Co-)Homology Invariant of Topological Manifolds and its Interface with Boundary Value Problems in Riemannian Geometry.* Preliminary report.

Let N be a closed n -dimensional topological manifold and let $b_k(N)$ stand for the k -th Betti number of N . We define an invariant

$$A(N) = \sum_{k=0}^n kb_k(N)$$

Whereas when n is even $A(N)$ is just $\frac{n}{2}\chi(N)$, for n odd, $A(N)$ is actually a global invariant which is non-zero in general. In this talk, we compute $A(N)$ for certain spaces and illustrate some of its properties. For manifolds M with boundary N , the invariant is also defined with each of absolute and relative (co-)homologies. When M is an even dimensional Riemannian manifold with boundary N , we show an interesting linkage between the Euler characteristics of M obtained from differential forms satisfying the Neumann and Dirichlet conditions on N and the value of $A(N)$. (Received September 16, 2008)