

**THE ATIYAH-PATODI-SINGER INDEX ON MANIFOLDS WITH
NON-COMPACT BOUNDARY**

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We study the index of the APS boundary value problem for a strongly Callias-type operator D on a complete Riemannian manifold M . We use this index to define the relative eta-invariant of two strongly Callias-type operators A and A' , which are equal outside of a compact set. Even though in our situation the eta-invariants of A and A' are not defined, the relative eta-invariant behaves as if it were the difference of the eta-invariants of A and A' . We also define the spectral flow of a family of such operators and use it to compute the variation of the relative eta-invariant. (Joint work with Pengshuai Shi)