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  - Relative index theorems and analytic torsion for open manifolds
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[(DVI file)](#)

For non-negative elliptic differential operators on closed manifolds, we have a well-established index theory and the notion of analytic torsion. On open manifolds, this becomes wrong since such operators must not have a finite dimensional kernel and cokernel and the spectrum must not be purely discrete. But there is a possibility to establish a similar theory for pairs of operators D,D', where D' is an appropriate perturbation of D. We consider pairs D^2,D'^2, where D,D' are generalized Dirac operators (e.g. Laplace operators) and D' is an appropriate perturbation of D. Doing this, there arise two canonical questions:

1. what are appropriate perturbations and
2. is $e^{-tD^2} - e^{-t\tilde{D'}^2}$ a trace class operator,

where $\tilde{D'}$ is a certain transformation of D'? We answer these two questions and establish in fact a very general relative index and analytic torsion theory.

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2 images