1001-53-300 **Thomas Branson*** (`thomas-branson@uiowa.edu`), Department of Mathematics, University of Iowa, Iowa City, IA 52242, and **A. Rod Gover**, Department of Mathematics, University of Auckland, Auckland, New Zealand. *Detour torsion.*

We define new spectral invariants of the de Rham complex on even-dimensional Riemannian signature conformal manifolds, the *detour torsions*. These arise as torsions of *detour complexes*, which we constructed in earlier work (math.DG/0309085). One of the coboundary operators of the kth detour complex is, in the oriented case, a conformally invariant differential operator L_k of order $n - 2k$ from k-forms to $(n - k)$-forms. In the special case $k = (n - 2)/2$, the operator L_k is simply δd and we recover *Cheeger's half-torsion*. In the special case $k = 0$, the detour torsion is the functional determinant of the *critical Graham-Jenne-Mason-Sparling operator* L_0. Our construction extends (with suitable adjustments of weight parameters in the torsion formula) to all *regular generalized Bernstein-Gelfand-Gelfand* (gBGG) *diagrams* for conformal structure, when these are elliptic complexes; in particular, in the conformally flat case. (Received August 30, 2004)

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