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that it has no poles at all and hence is constant. Thus the character of S^1 given by its action on $\text{Index}(d_S \otimes R(q))$ is constant, and so the action must be trivial as claimed. They then give separate arguments to extend this result to $D^+ \otimes R'_n$.

These results all extend in a straight forward way to S^1 actions preserving a foliation (see [HL 2]).

REFERENCES

- [AB] ATIYAH, M. F. and R. BOTT. The Lefschetz fixed point formula for elliptic complexes I and II. *Annals of Math.* 86 (1967), 374–407; 88 (1968), 451–491.
- [ABP] ATIYAH, M. F., R. BOTT and V.K. PATODI. On the Heat Equation and the Index Theorem. *Invent. Math.* 19 (1973), 279–330; errata *ibid* 28 (1975), 277–280.
- [ABS] ATIYAH, M. F., R. BOTT and A. SHAPIRO. Clifford Modules. *Topology* 3, Suppl. 1 (1964), 3–38.
- [AH] ATIYAH, M. F. and F. HIRZEBRUCH. Spin Manifolds and Group Actions. *Essays on Topology and Related Topics* (Mémoires dédiés à Georges de Rham), Springer Verlag, New York (1970), 18–27.
- [AS] ATIYAH, M. F. and I. M. SINGER. The index of elliptic operators : III, *Annals of Math.* 87 (1968), 546–604.
- [Be] BENAMEUR, M-T. Un théorème de Lefschetz longitudinal en K-théorie équivariante. *C.R.A.S. (Série I)* 317 (1993), N° 5, 491–494.
- [B] BISMUT, J. M. The Atiyah-Singer index theorem for families of Dirac operators : two heat equation proofs. *Invent. Math.* 83 (1986), 91–151.
- [BT] BOTT, R. and C. TAUBES. On the Rigidity Theorems of Witten. *Journal of AMS* 2 (1989), 137–186.
- [C] CONNES, A. Sur la Théorie Non-Commutative de l’Intégration, Algèbres d’Opérateurs. Springer Verlag, Berlin. *Lecture Notes in Math.* 725 (1979), 19–143.
- [G] GETZLER, E. A short proof of the local Atiyah-Singer Index Theorem. *Topology* 25 (1986), 111–117.
- [Gi] GILKEY, P. Invariance Theory, the Heat Equation, and the Atiyah-Singer Index Theorem. Publish or Perish Press, Wilmington, Del. *Math. Lec. Series* 11 (1984).
- [Ha] HAEFLIGER, A. Some remarks on foliations with minimal leaves. *J. Diff. Geo.* 15 (1980), 269–284.
- [He] HEITSCH, J. L. Bismut superconnections and the Chern character for Dirac operators on foliated manifolds. *K-Theory* 9 (1995), 507–528.
- [HL 1] HEITSCH, J. L. and C. LAZAROV. A Lefschetz Theorem for Foliated Manifolds. *Topology* 29 (1990), 127–162.
- [HL 2] HEITSCH, J. L. and C. LAZAROV. Rigidity theorems for foliations by surfaces and spin manifolds. *Mich. J. Math.* 38 (1991), 285–297.

- [HL 3] HEITSCH, J. L. and C. LAZAROV. Riemann-Roch-Grothendieck and torsion for foliations. In preparation.
- [H] HIRZEBRUCH, F. *Topological Methods in Algebraic Geometry*. Springer, Berlin-Heidelberg-New York, 1966.
- [KN] KOBAYASHI, S. and K. NOMIZU. Foundations of Differential Geometry, Vol. II. *Interscience*, New York, 1969.
- [LM] LAWSON, H. B. and M.-L. MICHELSOHN. *Spin Geometry*. Princeton University Press, 1989.
- [M] MILNOR, J. *Characteristic Classes*. Princeton University Press. *Annals of Math. Studies* 76 (1974).
- [P] PATODI, V. K. Curvature and the eigenforms of the Laplace operator. *J. Diff. Geo.* 5 (1971), 233–249, and An analytic proof of the Riemann-Roch-Hirzebruch theorem for Kaehler manifolds, *ibid*, 251–283.
- [RS] REED, M. and B. SIMON. *Functional Analysis*. Academic Press, New York, 1972.
- [S] SEELEY, R. T. Complex powers of an elliptic operator, *AMS Proc. Symp. Pure Math.* 10 (1967), 288–307.
- [T] TAUBES, C. S^1 -actions and elliptic genera. Preprint, 1987.
- [Wa] WARNER, F. *Foundations of Differentiable Manifolds and Lie Groups*. Scott Foresman, New York, 1971.
- [W] WITTEN, E. Elliptic genera and quantum field theory. *Commun. Math. Phys.* 109 (1987), 525, and The Index of the Dirac operator on loop space, in *Elliptic Curves and Modular Forms in Algebraic Topology*, P. S. Landweber, ed., *Lecture Notes in Math.* 1326, Springer Verlag, Berlin, 1988.

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