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Proof of Theorem 1.5. We show $-p_*\tau(\bar{\Phi}^\gamma)_*([S^1])$ coincides with Definition B₁. As in the proof of Theorem 1.1(i) above, we may assume that X is a compact polyhedron which is PL embedded in some \mathbf{R}^n as a strong deformation retract of a compact codimension 0 PL submanifold, M . Extend Φ^γ to a map $\Psi^\gamma: M \times S^1 \rightarrow X \hookrightarrow M$ by precomposing with $r \times \text{id}$ where $r: M \rightarrow X$ is a strong deformation retraction. The homotopy invariance of Definition B₁ and Theorem 10.1 imply that $-I_R(\Psi^\gamma) = \chi_1(X, R)(\gamma)$. By [D₃, (3.3)] and [BG, §9], $I_R(\Psi^\gamma)$ coincides with $p_*\tau(\bar{\Phi}^\gamma)_*([S^1])$. \square

REFERENCES

- [Ba] BASS, H. Euler characteristics and characters of discrete groups. *Invent. Math.* 35 (1976), 155-196.
- [BG] BECKER, J.C. and D.H. GOTTLIEB. Transfer maps for fibrations and duality. *Compositio Math.* 33 (1976), 107-133.
- [Bi] BIERI, R. *Homological dimension of discrete groups*. Second edition, Queen Mary College, Department of Pure Mathematics, London, 1981.
- [B] BROWN, K.S. *Cohomology of Groups*. Springer-Verlag, New York, 1982.
- [Br] BROWN, R.F. *The Lefschetz fixed point theorem*. Scott Foresman, Chicago, 1971.
- [C] COOKE, G. Replacing homotopy actions by topological actions. *Trans. Amer. Math. Soc.* 237 (1978), 391-406.
- [Di] DIMOVSKI, D. One-parameter fixed point indices. *Pacific J. Math.* 164 (1994), 263-297.
- [DG] DIMOVSKI, D. and R. GEOGHEGAN. One-parameter fixed point theory. *Forum Math.* 2 (1990), 125-154.
- [D₁] DOLD, A. Fixed point index and fixed point theorem for Euclidean neighborhood retracts. *Topology* 4 (1965), 1-8.
- [D₂] ——— *Lectures on algebraic topology*. Second edition, Springer-Verlag, New York, 1980.
- [D₃] ——— The fixed point transfer of fibre-preserving maps. *Math. Z.* 148 (1976), 215-244.
- [DV] DYER, E. and A.T. VASQUEZ. An invariant for finitely generated projectives over $\mathbf{Z}G$. *J. Pure Appl. Algebra* 7 (1976), 241-248.
- [Eck] ECKMANN, B. Cyclic homology of groups and the Bass conjecture. *Comment. Math. Helv.* 61 (1986), 193-202.
- [G] GEOGHEGAN, R. The homomorphism on fundamental group induced by a homotopy idempotent having essential fixed points. *Pacific J. Math.* 95 (1981), 85-93.
- [GN₁] GEOGHEGAN, R. and A. NICAS. Parametrized Lefschetz-Nielsen fixed point theory and Hochschild homology traces. *Amer. J. Math.* 116 (1994), 397-446.
- [GN₂] GEOGHEGAN, R. and A. NICAS. Trace and torsion in the theory of flows. *Topology* 33 (1994), 683-719.

- [GN₃] GEOGHEGAN, R. and A. NICAS. The first order Euler characteristic. *The Hilton Symposium 1993 – Topics in Topology and Group Theory*, CRM Proceedings and Lecture Notes, Vol. 6, Amer. Math. Soc., Providence, RI, 1994, pp. 37-59.
- [GN₄] GEOGHEGAN, R. and A. NICAS. Homotopy periodicity and coherence. (Preprint)
- [GN₅] GEOGHEGAN, R. and A. NICAS. Higher Euler characteristics, II. (in preparation)
- [GNO] GEOGHEGAN, R., A. NICAS and J. OPREA. Higher Lefschetz Traces and spherical Euler characteristics. (Preprint)
- [Got] GOTTLIEB, D.H. A certain subgroup of the fundamental group. *Amer. J. Math.* 87 (1965), 840-856.
- [I] IGUSA, K. What happens to Hatcher and Wagoner's formula for $\pi_0 C(M)$ when the first Postnikov invariant is nontrivial? *Algebraic K-theory, Number theory, Geometry and Analysis*. Lecture notes in Math. vol. 1046, Springer-Verlag, New York, 1984, pp. 104-172.
- [J] JIANG, B.-J. *Lectures on Nielsen fixed point theory*. Contemporary Math., Vol. 14, Amer. Math. Soc., Providence, RI, 1983.
- [Kn] KNILL, R. J. On the homology of a fixed point set. *Bull. Amer. Math. Soc.* 77 (1971), 184-190.
- [Le] LERAY, J. Sur les équations et les transformations. *J. Math. Pures Appl.* (9) 24 (1945), 201-248.
- [Ly] LYNDON, R. C. Cohomology theory of groups with a single defining relation. *Annals of Math.* 52 (1950), 650-665.
- [MS] MILNOR, J. and J. STASHEFF. *Characteristic Classes*. Ann. of Math. Studies, No. 76, Princeton Univ. Press, Princeton, NJ, 1974.
- [Mu] MURASUGI, K. The center of a group with a single defining relation. *Math. Annalen* 155 (1964), 246-251.
- [Sch] SCHAFER, J. A. Relative cyclic homology and the Bass conjecture. *Comment. Math. Helv.* 67 (1992), 214-225.
- [Sp] SPANIER, E. H. *Algebraic topology*. McGraw-Hill, New York, 1966.
- [St] STALLINGS, J. Centerless groups – An algebraic formulation of Gottlieb's theorem. *Topology* 4 (1965), 129-134.

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