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Mona Mocanasu* (mocanasu@math.northwestern.edu), 2033 Sheridan Road, Evanston, IL 60208. *Push-Forward Maps in Theories of Cohomology with Support.*

For smooth schemes most homology and cohomology theories come in pairs, connected by a Poincare duality. But if we want to study singular quasi-projective schemes, our main tools are singular homology theories. The goal of this talk is to describe $A^*(M, M \setminus X)$, the cohomology with support associated to a given singular Borel-Moore homology structure $H_*(X)$, and to study in what cases a Poincare-style duality still holds between the two theories.

This general construction is inspired by the bivariant theories for differential manifolds of W. Fulton and R. MacPherson, and it is consistent with the known cases; for example, it connects singular Chow groups $CH_*(X)$ with the Operational Chow Groups for closed embeddings, $A^*(X \rightarrow Y)$.

The push-forwards f_* associated to proper morphisms encode the information needed for the Poincare duality. In particular, if the push-forward structure is good enough, one can carry back results from the cohomology theory onto the homology one, where some computations may prove too difficult. For example, while the Riemann-Roch theorem is known for the Steenrod operations of cohomological type, such a result does not exist yet for the singular Steenrod operations. (Received January 18, 2007)