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*The Weighted  $L^2$ -(co)homology of Coxeter Groups.*

A recurring theme in geometric group theory is studying the algebraic properties of a group by studying a space on which the group acts on. Associated to a Coxeter group  $W$ , there is a particular contractible simplicial complex  $\Sigma$  called the Davis complex on which  $W$  acts properly and cocompactly by reflections. Given a positive real multiparameter  $\mathbf{q}$ , one can define the weighted  $L^2$ -(co)homology groups of  $\Sigma$  and associate to them a nonnegative real number called the weighted  $L^2$ -Betti number. This equivariant homology theory can be thought of as an elegant geometric interpretation of the growth series of the Coxeter group, and it is closely tied to several other topics such as the Singer conjecture. I plan to briefly outline some of these connections, and discuss my contributions to this topic. (Received September 15, 2014)