

# The fattened Davis complex and weighted $L^2$ -(co)homology of Coxeter groups

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## **Abstract**

Associated to a Coxeter system  $(W, S)$  there is a 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. Unfortunately, not much is known about the behavior of these groups when  $\mathbf{q}$  lies outside a certain restricted range, and weighted  $L^2$ -Betti numbers have proven difficult to compute. In this talk I will propose a program to compute the weighted  $L^2$ -(co)homology of  $\Sigma$  by considering a thickened version of this complex. The program proves successful provided that we can understand the weighted  $L^2$ -(co)homology of non-spherical special subgroups of  $W$ . I will then specialize to a certain class of Coxeter groups and perform some computations.