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Bieri-Neumann-Strebel-Renz invariants and homology jumping loci.

We give computable upper bounds for the Σ -invariants of a finitely generated group G , in terms of the jump loci for homology with coefficients in rank 1 local systems. Under suitable hypothesis, these bounds can be expressed in terms of simpler data, namely, the resonance varieties associated to the cohomology ring of G . Some of this is reminiscent of the relationship between the Thurston norm and the Alexander polynomial of a closed 3-manifold. Yet these new bounds capture different phenomena, yielding information on groups that arise in a variety of geometric and topological contexts, such as right-angled Artin groups, Bestvina-Brady groups, and Kähler groups. (Received August 10, 2008)