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**Determining the action dimension of an Artin group by using its complex of abelian subgroups.** (English) [Zbl 1433.20011](#)

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Summary: Suppose that  $(W, S)$  is a Coxeter system with associated Artin group  $A$  and with a simplicial complex  $L$  as its nerve. We define the notion of a ‘standard abelian subgroup’ in  $A$ . The poset of such subgroups in  $A$  is parameterized by the poset of simplices in a certain subdivision  $L_{\mathcal{O}}$  of  $L$ . This complex of standard abelian subgroups is used to generalize an earlier result from the case of right-angled Artin groups to case of general Artin groups, by calculating, in many instances, the smallest dimension of a manifold model for  $BA$ . (This is the ‘action dimension’ of  $A$  denoted  $\text{actdim } A$ .) If  $H_d(L; \mathbb{Z}/2) \neq 0$ , where  $d = \dim L$ , then  $\text{actdim } A \geq 2d + 2$ . Moreover, when the  $K(\pi, 1)$ -Conjecture holds for  $A$ , the inequality is an equality.

**MSC:**

- [20F36](#) Braid groups; Artin groups
- [20F55](#) Reflection and Coxeter groups (group-theoretic aspects)
- [20F65](#) Geometric group theory
- [57S30](#) Discontinuous groups of transformations
- [57Q35](#) Embeddings and immersions in PL-topology
- [20J06](#) Cohomology of groups
- [32S22](#) Relations with arrangements of hyperplanes

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