1139-05-142 **Ayush Agarwal** and **Christian Gaetz*** (gaetz@mit.edu). *Differential posets, Cayley graphs, and critical groups of group representations.*

In recent work, Benkart, Klivans, and Reiner defined the critical group of a faithful representation of a finite group, which is analogous to the critical group of a graph. I will discuss maps between critical groups induced by injective group homomorphisms and in particular the map induced by restriction of the representation to a subgroup. We prove that in the abelian group case the critical groups are isomorphic to the critical groups of a certain Cayley graph and that the restriction map corresponds to a graph covering map. We also prove that when the group is an element in a differential tower of groups, critical groups of certain representations are closely related to words of up-down maps in the associated differential poset. This information is used to generalize an explicit formula for the critical group of the permutation representation of the symmetric group given by the second author, and to enumerate the factors in such critical groups. (Received February 06, 2018)