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Ian M Musson* (musson@uwm.edu). *The lattice of submodules of a multiplicity free module.*

In this paper we study the lattice of submodules Λ of a module M all of whose composition factors have multiplicity one. Such a lattice is distributive, and hence determined by its poset of down-sets P . We define a directed Ext graph Ext_Λ of Λ and show that Ext_Λ determines P . The result applies to multiplicity free indecomposable modules for finite dimensional algebras with acyclic Ext graph. We also apply our methods to modules in the category \mathcal{O} for a semisimple Lie algebra or a classical simple Lie superalgebra. Projective indecomposable modules over the preprojective algebra of type A provide important and interesting examples of modules with distributive lattices of submodules, which are not multiplicity free in general. Many of our results hold in the more general distributive case. (Received August 06, 2015)