

1102-17-52

**Apoorva Khare\*** ([khare@stanford.edu](mailto:khare@stanford.edu)). *Faces and standard parabolic subsets of highest weight modules.*

We report on recent progress in the study of arbitrary highest weight modules  $\mathbb{V}^\lambda$ , for all highest weights  $\lambda$  and over any complex semisimple Lie algebra  $\mathfrak{g}$ . The results in our talk are threefold. First, we present three formulas to compute the set of weights of all simple highest weight modules (and others) over  $\mathfrak{g}$ . These formulas are direct and do not involve cancellations. Our results extend the notion of the Weyl polytope to general highest weight  $\mathfrak{g}$ -modules (and the Weyl Character Formula to most simple modules). Second, we classify and describe the vertices, faces, and their symmetries for a very large class of highest weight modules, including all parabolic Verma modules and their simple quotients. Third, we completely classify inclusion relations between standard parabolic faces of arbitrary modules  $\mathbb{V}^\lambda$ , in the process extending results of Vinberg, Chari, Cellini, and others from finite-dimensional modules to all highest weight modules. (Received July 11, 2014)