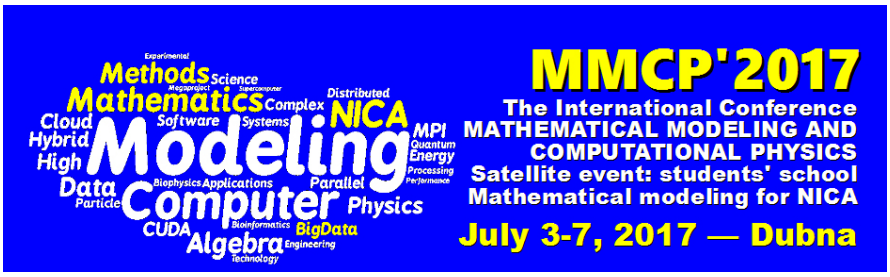

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A NEW APPROACH TO WEIGHT MULTIPLICITY IN REPRESENTATIONS OF COMPACT LIE GROUPS

Friday 7 July 2017 12:45 (15 minutes)

The multiplicity of a weight of an irreducible finite-dimensional representation of a complex semisimple Lie algebra can in principle be evaluated by using the celebrated Kostant multiplicity formula, which employs summation of values of Kostant partition function over the Weyl group of the algebra. While Kostant's formula is quite elegant, it is usually not suitable for computations due to the size of the Weyl group. From the computational point of view, storing all data about the Weyl group consumes an enormous amount of space. In practice, computer methods based on the recursive method of Freudenthal are usually implemented. Another inductive formula is that of Racah, which also uses summation over the Weyl group. The new direct approach to weight multiplicity suggests a method for computing the weight multiplicity that does not use summation over the Weyl group and is not recursive. The method is based on localized partition functions.

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