Irreducible Representations of Special Unitary Group and their connection to Tensors

Partha Nag

September 11, 2004

Abstract

It is not possible to write the multiplication table of an infinite continuous group in the ordinary sense. So we can not also obtain its irreducible representations by following the method of reducing a finite discrete group. Here, I take as an example the "Special Unitary" group and demonstrate how its irreducible representations are generated by tensors and characterised by their symmetries. I also present the "Young Tableaux" method to describe the decomposition of product of $SU(n)$ irreducible representations into irreducible representations of $SU(n)$.

References

[1] J. Mathews and R.L. Walker, Mathematical Methods of Physics, W.A. Bejamin,inc., New York(1964)

[2] M. Tinkham, Group Theory and Quantum Mechanics, Mc Graw-Hill,inc.,USA(1964)

[3] G.B. Arfken and H.J. Weber, Mathematical Methods for Physicists, 5/e, Academic Press, San Diego,USA(2001)

[4] J.J. Sakurai, Modern Quantum Mechanics, Pearson Education(Singapore),Delhi(2004)