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**Rajeev Walia\*** ([waliaraj@math.msu.edu](mailto:waliaraj@math.msu.edu)), 1413 B Spartan Village Apts., East Lansing, MI 48823. *Tensor factorization and Spin construction for Kac-Moody algebras.*

We will discuss the “Factorization Phenomenon” which occurs when a representation of a Lie algebra is restricted to a subalgebra, and the result factors into smaller representations of the subalgebra. The original Lie algebra may be *any* symmetrizable Kac-Moody algebra (including finite-dimensional, semi-simple Lie algebras). We will provide an algebraic explanation for such a phenomenon using “Spin construction”. We will present a few Factorization results for any embedding of a symmetrizable Kac-Moody algebra into another, using Spin construction and give some combinatorial consequences of it. We will extend the notion of Spin from finite-dimensional to symmetrizable Kac-Moody algebras which requires a very delicate treatment. We will introduce a category of “ $d$ -finite, Orthogonal Level zero” representations for which, surprisingly, the Spin gives a representation in the Bernstein-Gelfand-Gelfand category  $\mathcal{O}$ . We will give the formula for the character of Spin for the above category and refine the factorization results in the case of affine Lie algebras. Finally, we will discuss classification of “Coprimary representations” i.e those representations whose Spin is irreducible. (Received February 26, 2007)