

**SPACE OF INVARIANT BILINEAR FORMS UNDER A
REPRESENTATION OF $SL_2(3)$**

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Abstract: Let n be a positive integer. In this paper we compute the space of invariant bilinear forms under an n degree representation of the special linear group $SL_2(3)$ and its dimension over the complex field \mathbb{C} . We discuss the existence of a non-degenerate invariant bilinear form explicitly.

Keywords and Phrases: Bilinear forms, Representation theory, Vector space, Direct sums.

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1. Introduction

Representation theory enables the study of a group as operators on certain vector spaces. Since last several years the search of non-degenerate invariant bilinear forms has remained of great importance among researcher. Such types of studies acquire an important place in quantum mechanics and other branches of physical sciences.

Let G be a finite group and \mathbb{V} , a vector space over a field \mathbb{F} , then we have following.