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**The Universal Enveloping Algebra  $U(\mathfrak{sl}_2 \rtimes V_2)$ , its Prime Spectrum and  
a Classification of its Simple Weight Modules**

For the enveloping algebra  $A$  of the Lie algebra  $\mathfrak{sl}_2 \rtimes V_2$ , explicit descriptions of its prime, primitive, completely prime and maximal spectra are given. A classification of simple weight  $\mathfrak{sl}_2 \rtimes V_2$ -modules is given. Generators and defining relations are found for the centralizer  $C_A(H)$  in  $A$  of the Cartan element  $H$  of  $\mathfrak{sl}_2 \rtimes V_2$ . Explicit descriptions of the prime, primitive, completely prime and maximal spectra of  $C_A(H)$  are given. Simple  $C_A(H)$ -modules are classified.

**Keywords:** Prime ideal, primitive ideal, weight module, simple module, centralizer.

**MSC:** 17B10, 16D25, 16D60, 16D70, 16P50