

Finite order automorphisms on Borcherds algebras

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Under certain conditions, a Borcherds (or Generalized Kac-Moody algebra) \mathfrak{g} defined from a symmetrizable matrix can be decomposed as $\mathfrak{g} = \mathfrak{u}^- \oplus (\mathfrak{g}\mathcal{J} + \mathfrak{h}) \oplus \mathfrak{u}^+$ where $\mathfrak{g}\mathcal{J}$ is a Kac-Moody algebra defined from a symmetrizable Cartan matrix, and \mathfrak{u}^+ , \mathfrak{u}^- are subalgebras isomorphic to free Lie algebras over given \mathfrak{g} -modules. In the case of the monster Lie algebra, the result is a decomposition into $(\mathfrak{gl}(2), M)$ -modules, where M is the monster simple group. I am interested in computing the effect of finite order automorphisms (which may come from M) on the free components of the decomposition. In particular, it is well known that subalgebras of free Lie algebras are again free. I am interested in computing generating sets of the invariant subalgebras that may take a useful or elegant form.