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PREHOMOGENEOUS VECTOR SPACE DEFINED BY A SEMISIMPLE ALGEBRAIC GROUP

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1. **Introduction.** Let G be an affine algebraic group defined over C, and π a rational representation of G in a finite-dimensional vector space V. Following the terminology of [6] and [7], we say that V is a prehomogeneous vector space if π has a (unique) open orbit. In [7] F. J. Servedio gave some characterization of the stabilizer G_0 defined by an irreducible prehomogeneous vector space (G, V). Namely, he has proven that G_0 is reductive iff (G', V) is not a prehomogeneous vector space, where G' is the (semisimple) commutator subgroup of G.

It follows from this characterization that if (G, V) is an irreducible prehomogeneous vector space with G semisimple, then the corresponding stabilizer is not reductive. In this paper we would like to determine the stabilizer more affirmatively in the case G is semisimple.

2. **Statements of the main results.** The following theorem will give a proper determination of the stabilizer mentioned above.

THEOREM 1. *Let (G, V) be a prehomogeneous vector space with G semisimple, let G_0 be the corresponding stabilizer. Then the radical of G_0 is a nontrivial unipotent subgroup of G_0.*

This result turns out to be the key for the determination of infinite-dimensional square-integrable representations of certain classes of groups called the U-groups [1].

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[1] The Society was unable to locate this author; corrections were done by Professor Hyman Bass.