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### **Cartan Pairs and Shared Orbit Pairs**

We study a class of pairs of Lie algebras  $(\mathfrak{g}, \mathfrak{g}_1)$  that we call Cartan pairs; here  $\mathfrak{g}$  is semisimple and  $\mathfrak{g}_1$  is a reductive in  $\mathfrak{g}$  subalgebra. For these pairs, which generalize symmetric ones, we have standardly defined Cartan subspaces, and consequently the set of restricted roots  $\Sigma(\mathfrak{g}, \mathfrak{a})$ . We prove that there are infinitely many interesting nonsymmetric Cartan pairs. Next we prove that every pair of the well known Brylinski-Kostant list of shared orbit pairs is a Cartan pair. As a continuation of the previous research we obtained some further useful and clarifying results and examples related to Cartan pairs and Cartan subspaces.

**Keywords:** Semisimple Lie algebra, Cartan subalgebra, nonsymmetric pair, Kostant pair, Cartan subspace, Cartan pair, restricted root, set of restricted roots, shared orbit pair.

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