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Corrigendum

The structure of the invariants of perfect Lie algebras

R Campoamor-Stursberg 2003 *J. Phys. A: Math. Gen.* **36** 6709–6723

We would like to correct two inaccuracies in the above paper. The comment after equation (4) concerning the dependence of the Casimir invariants of $\mathfrak{g} = \mathfrak{sl}(2,\mathbb{R}) \overrightarrow{\oplus}_{2D_1} 6L_1$ on the variables $\{x_1, x_2, x_3\}$ associated with the Levi part is incorrect. Indeed, as follows at once from the system of PDEs associated with equation (4) (or application of proposition 5 in section 4), for any invariant C of $\mathfrak{g}$ we have

$$\frac{\partial C}{\partial x_i} = 0, \quad i = 1, 2, 3.$$

The correct statement is therefore that no fundamental set of invariants formed by functions dependent on $\{x_1, x_2, x_3\}$ can be found. In consequence, the function I_3 listed in the paper is not a Casimir operator of $\mathfrak{g}$, since it does not satisfy the previous condition. The missing invariant can be computed easily, and we obtain, for example:

$$I_3 = 2x_4x_9 + 2x_6x_7 - x_5x_8.$$

The second inaccuracy corresponds to a redundance in the proof of proposition 1. The argument following the sentence finishing after equation (5) should be deleted, since the assertion is already proved. In fact, the ideal $J = [\mathfrak{g}, \mathfrak{g}] \cap \mathfrak{r}$ (where $\mathfrak{r}$ is the radical of $\mathfrak{g}$) used equals the so-called nilpotent radical of $\mathfrak{g}$ (see e.g. [1]), which is itself nilpotent, and is contained in the nilradical $\mathfrak{n}$ of $\mathfrak{g}$. Since equation (5) implies the equality $J = \mathfrak{r}$, we obtain from the relation $J \subset \mathfrak{n} \subset \mathfrak{r}$ that $\mathfrak{n} = \mathfrak{r}$, thus the radical of $\mathfrak{g}$ is nilpotent. These precisions do not affect the rest of the paper.

References

[1] Dixmier J 1974 *Algèbres Enveloppantes* (Paris: Hermann)

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