Determinantal formulae for the Casimir operators of inhomogeneous Lie algebras

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Corrigendum

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The author would like to correct some inaccuracy in formula (6), concerning the contraction of Casimir operators, which is wrong in the stated form. Let $\mathfrak{g} \rightsquigarrow \mathfrak{g}'$ be a nontrivial contraction. Without loss of generality we can suppose that the contraction is given, over some basis, by a transformation of the type [1]:

$$\Phi_t(X_i) = t^{-n_i} X_i, \quad n_i \in \mathbb{Z} \tag{1}$$

where $\{X_1, .., X_n\}$ is a basis of $\mathfrak{g}$. If $F(X_1, ..., X_n) = \alpha^{i_1 \ldots i_p} X_{i_1} \ldots X_{i_p}$ is a Casimir operator of degree p, then the transformed invariant takes the form

$$F(\Phi_t(X_1), .., \Phi_t(X_n)) = t^{n_{i_1}+\ldots+n_{i_p}} \alpha^{i_1 \ldots i_p} X_{i_1} \ldots X_{i_p}. \tag{2}$$

Now, taking

$$M = \max \left\{ n_{i_1} + \ldots + n_{i_p} \quad | \quad \alpha^{i_1 .. i_p} \neq 0 \right\} \tag{3}$$

the limit

$$F'(X_1, .., X_n) = \lim_{t \to \infty} t^{-M} F(\Phi_t(X_1), ..., \Phi_t(X_n)) = \sum_{n_{i_1}+\ldots+n_{i_p}=M} \alpha^{i_1 \ldots i_p} X_{i_1} \ldots X_{i_p} \tag{4}$$

provides a Casimir operator of degree p of the contraction $\mathfrak{g}'$. It is therefore the number M related to the transformation and not the degree of the Casimir operator which determines the contracted operator, as misleadingly written in the paper.

It should be remarked that, depending on the fundamental system of invariants of $\mathfrak{g}$ considered, the contracted invariant is not necessarily of minimal degree in the contraction, since it can be some function of contracted invariants of lower degree (see section 3 of the paper).

This incorrect statement of formula (6) does not effect the later analysis and the conclusions of the original paper.

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References

[1] Weimar-Woods E 2000 *Rev. Math. Phys.* **12** 1505