Canad. Math. Bull. Vol. **58** (1), 2015 pp. 69–70
http://dx.doi.org/10.4153/CMB-2014-039-1

Correction to "Infinite Dimensional DeWitt Supergroups and Their Bodies"

Ronald Owen Fulp

Abstract. We provide a correction to Theorem 3.5 in the article entitled "Infinite Dimensional DeWitt Supergroups and their Bodies" (Canad. Math. Bull. 57(2014), no. 2, 283–288).

This note provides a correction to Theorem 3.5 in [1]. Only part (iii) of that theorem requires a correction, as the original proof failed to separate the proof of (ii) from the proof of (iii). The proof of [1, Theorem 3.5(ii)] was complete once it was established that ad_a is quasi-nilpotent for each a, since it follows from this that K is quasi-nilpotent. The proof of (iii) was not complete as stated in the original article. The correction consists of a revised part (iii), along with its proof, in the following version.

Theorem 3.5 *Let G be a DeWitt super Lie group such that there is an induced group structure on BG. Let* $\beta\colon G \to BG$ *denote the induced group homomorphism and let K be its kernel.*

(i) *K is a Banach Lie group whose Lie algebra* κ *is a freely finitely generated* Λ^0 *left module.*
(ii) *The Lie module* κ *is quasi-nilpotent, and consequently the Baker–Campbell–Hausdorff formula holds globally on it.*
(iii) *There is a group operation* $\diamond$ *on* κ *relative to which* κ *is a simply connected, global, Banach Lie group such that* $\exp(a)\exp(b) = \exp(a \diamond b)$ *for all* $a, b \in \kappa$. *Moreover K is simply connected and consequently is diffeomorphic to the Banach space* κ *and is isomorphic as a Banach Lie group to* $(\kappa, \diamond)$.

Proof of (iii) By a Theorem of Wojtynski [2], the global Baker–Campbell–Hausdorff formula holds for κ. Moreover, it has long been known that there is a local Lie group operation $\diamond$ on κ such that $\exp(a)\exp(b) = \exp(a \diamond b)$ for all $a, b \in \kappa$. Wojtynski's important contribution was to show that when κ is quasi-nilpotent, this operation is globally defined on κ, and that κ is, in fact, a global Banach Lie group relative to $\diamond$. We show that exp is a bijection. Note that $I = \exp(\kappa)$ is a subgroup of κ. It is an open subgroup, since exp is a local diffeomorphism that takes 0 to the identity of K. Also, I is connected as is K. An open connected subgroup of a connected group must be the entire group, so $\exp(\kappa) = K$. Since exp is a surjective homomorphism, K is isomorphic to κ modulo a discrete subgroup. Since there is a global chart from K

Received by the editors May 9, 2014.
Published electronically September 26, 2014.
AMS subject classification: **58B25**, 17B65, 81R10, 57P99.
Keywords: super groups, body of super groups, Banach Lie groups.

onto $\widetilde{\mathbb{R}^{p|q}}$, K is simply connected. But both K and κ are simply connected, and so the kernel of exp must be trivial. Thus, κ and K are diffeomorphic and isomorphic. ■

References

[1] R. Fulp, *Infinite dimensional DeWitt supergroups and their bodies.* Canad. Math. Bull. **57**(2014), no. 2, 283–288. http://dx.doi.org/10.4153/CMB-2013-025-6

[2] W. Wojtynski, *Quasi-nilpotent Banach-Lie algebras are Baker-Campbell-Hausdorff.* J. Funct. Anal. **153**(1998), no. 2, 405–413 http://dx.doi.org/10.1006/jfan.1997.3202

North Carolina State University, Department of Mathematics, North Carolina State University, Raleigh NC 27695, USA
e-mail: fulp@math.ncsu.edu