PROCEEDINGS OF THE
AMERICAN MATHEMATICAL SOCIETY
Volume 139, Number 1, January 2011, Pages 383–384
S 0002-9939(2010)10579-8
Article electronically published on September 3, 2010

ERRATUM TO "FINITELY PRESENTABLE, NON-HOPFIAN GROUPS WITH KAZHDAN'S PROPERTY (T) AND INFINITE OUTER AUTOMORPHISM GROUP"

YVES DE CORNULIER

(Communicated by Daniel Ruberman)

ABSTRACT. In the article *Finitely presentable, non-Hopfian groups with Kazhdan's Property (T) and infinite outer automorphism group*, Proc. Amer. Math. Soc. **135** (2007), 951–959, the second main result is the construction of a non-Hopfian, finitely presented Kazhdan group. The proof of its finite presentability has a little flaw, which is fixed here.

In the article [C], a certain group Γ is constructed (Definition 2.4) and is claimed (Theorem 1.3) to be finitely presented. This claim is true, but the proof relies on a misquotation of Abels' results. Namely, Theorem 3.1, attributed to Abels, is not true as stated in [C] (especially [C, "Theorem" 3.1(iii)] is irrelevant). Fortunately, the computation in the subsequent proof is not only correct, but it contains all verifications necessary to fix the issue. We now describe in detail the necessary corrections.

Theorem 3.1 of [C] has to be replaced with the following (if V is an S-module, V^S denotes the subspace of vectors fixed by S).

Theorem 3.1 (corrected) [A]. *Let G be a connected linear algebraic group over $\mathbf{Q}_p$. Suppose that G is split unipotent-by-semisimple, i.e. $G = US$, where U is the unipotent radical and S is a split semisimple Levi factor without any simple factors of rank one. Then $G(\mathbf{Q}_p)$ is compactly presented if and only if the two following conditions are satisfied*:

(i) $H_1(\mathfrak{u})^S = \{0\}$,
(ii) $H_2(\mathfrak{u})^S = \{0\}$.

This relies on [A, Theorem 6.4.3 and Remark 6.4.5]. In order not to misquote it a second time, a few comments are necessary.

- Condition (1a) of [A, Remark 6.4.5] involves the orthogonal $\Phi^\perp$ of the subspace generated by roots. It states that $\Phi^\perp$ does not contain dominant weights ω_1, ω_2 of the S-module $H_1(\mathfrak{u})$ with $0 \in [\omega_1, \omega_2]$. Since S is semisimple, $\Phi^\perp = \{0\}$ and (1a) just means that 0 is not a dominant weight, which is exactly condition (i) above. (Note that (i) is actually a necessary and sufficient condition for $G(\mathbf{Q}_p)$ to be compactly *generated*; see [A, Theorem 6.4.4].)

Received by the editors February 10, 2010 and, in revised form, May 1, 2010.
2000 *Mathematics Subject Classification.* Primary 20F28; Secondary 20G25, 17B56.

- As noticed in [A, p. 132], condition (1b) of [A, Remark 6.4.5] is superfluous when S has no factors of rank ≤ 1.
- Condition (ii) is a restatement of condition 2 of [A, Theorem 6.4.3].

Turning back to [C], the group Γ is written as $G(\mathbf{Z}[1/p])$ and it is explained that finite presentability of Γ follows from compact presentability of $G(\mathbf{Q}_p)$. We have to check that G satisfies the hypotheses as well as conditions (i) and (ii) of the corrected version of Theorem 3.1. The group G is written $G = US$, with U the unipotent radical and $S = \mathrm{SL}_{n_2} \times \mathrm{SL}_{n_3}$ $(n_2, n_3 \geq 3)$, so the hypotheses are fulfilled. Condition (i) actually follows from [C, Lemma 3.2] (where an unnecessarily stronger statement was proved). Condition (ii), which is the most technical point, has been checked [C, Lemma 3.6].

References

[A] H. Abels, *Finite presentability of S-arithmetic groups. Compact presentability of solvable groups.* Lecture Notes in Math. **1261**, Springer, 1987. MR903449 (89b:22017)

[C] Y. de Cornulier, *Finitely presentable, non-Hopfian groups with Kazhdan's Property (T) and infinite outer automorphism group.* Proc. Amer. Math. Soc. 135, 951–959, 2007. MR2262894 (2007g:20036)

Institut de recherche mathématique de Rennes, Campus de Beaulieu, 35042 Rennes Cedex, France

E-mail address: cornulier@gmail.com