ERRATUM

Erratum to: Hausdorffness for Lie algebra homology of Schwartz spaces and applications to the comparison conjecture

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The following changes to the main results of [1] are necessary:

(1) In Theorem A and Corollary B the following assumption is required: the number of orbits of the complexification \( H_C \) on \( G_C/P_C \) is finite, where \( P \) is a minimal parabolic subgroup of \( G \).

(2) In Theorem C the following additional assumption is required: the number of orbits of \( H_C \) on \( X_C \) is finite.

Presently we do not know whether these results hold without the additional assumptions.

The source of the mistake is in [2], where the expressions “real algebraic groups” and “real algebraic manifolds” are ambiguous. Moreover, a mistake in [2, Definition 1.1.1] hints to a wrong resolution of this ambiguity, in particular in [2, Theorem D]. This result entered in the proof of Lemma 3.2.1 of [1].

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In [2] the terms “real algebraic groups” and “real algebraic manifolds” sometimes mean algebraic groups and manifolds defined over $\mathbb{R}$, and sometimes real points of such. Those two meanings are not equivalent; in particular, the statement that an algebraic group $G$ defined over $\mathbb{R}$ acts on an algebraic manifold $X$ with finitely many orbits implies the statement that $G(\mathbb{R})$ acts on $X(\mathbb{R})$ with finitely many orbits, but is not equivalent to it. Rather, it is equivalent to the stronger statement that $G(\mathbb{C})$ has finitely many orbits on $X(\mathbb{C})$. In particular, in [2, Theorem D] one needs the stronger assumption (only then it follows from the Bernstein–Kashiwara theorem, [2, Thm 3.2.2]), see [3]. We do not know whether this theorem holds under the weaker assumption.

The argument in [1] proves the corrected versions of the main results (see (1, 2) above), after the following revision.

(a) In Sects. 2 and 3, the expression “real algebraic group” has to be replaced by “algebraic group defined over $\mathbb{R}$” and the expression “real algebraic manifold” has to be replaced by “algebraic manifold defined over $\mathbb{R}$”.

(b) One has to introduce the following notation: for an algebraic manifold $X$ defined over $\mathbb{R}$, a Zariski closed algebraic submanifold $Z$ and an algebraic bundle $E$ over $X$ denote $S_Z(X, E) := S_{Z(\mathbb{R})}(X(\mathbb{R}), E)$ and $S^*_Z(X, E) := S^*_{Z(\mathbb{R})}(X(\mathbb{R}), E)$, and similarly for the special cases $S(X), S(X, E), S_Z(X)$, and their dual spaces.

(c) In the proof of Lemma 3.2.1, one has to add that the reason that Proposition 3.1.1 implies the finiteness of the dimension of

$$H_0(h, S_Z(X, E)/S_Z(X, E)^{\dagger} \otimes \chi)$$

is that $Z(\mathbb{R})$ is a finite union of $H(\mathbb{R})$-orbits.

(d) In Sect. 4, $G$ should be the group of real points of an algebraic reductive group $G$ defined over $\mathbb{R}$, and $H$ should be the group of real points of an algebraic subgroup $H \subset G$. Also, each time that we require $H$ to be a real spherical subgroup we actually need to require the stronger condition that $H$ has finitely many orbits on $G/P$, where $P$ is a minimal parabolic subgroup of $G$ defined over $\mathbb{R}$.

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