CORRECTION TO THE PAPER "THE MOMENT PROBLEM FOR NON-COMPACT SEMIALGEBRAIC SETS"

VICTORIA POWERS AND CLAUS SCHEIDERER

Examples 3.14 (page 86): The hypotheses of Examples 4 and 5 need adjustment, as follows:

Example 4: The assertion for $n \leq 2$ is true. Also, for odd $n \geq 3$, the assertion is true, since in this case the curve C has exactly one point at infinity, which is real. If $n \geq 4$ is even (and C is real), there are two points at infinity which are both real. Therefore, the moment problem for K is not finitely solvable if K is unbounded on two half-branches of $C(\mathbb{R})$ at infinity which represent different points at infinity. Otherwise, the moment problem for K is finitely solvable.

More concretely, this means the following for $n \geq 4$. Let Q_1, Q_2, Q_3, Q_4 be the four quadrants of the real plane (numbered counter-clockwise in the usual way). If $n \equiv 0 \pmod 4$, the moment problem for K is finitely solvable iff at least one of

$$K \cap (Q_1 \cup Q_2), \quad K \cap (Q_3 \cup Q_4)$$

is bounded. If $n \equiv 2 \pmod 4$, the moment problem for K is finitely solvable iff at least one of

$$K \cap (Q_1 \cup Q_3), \quad K \cap (Q_2 \cup Q_4)$$

is bounded.

Example 5: For general $f(x, y)$ as in the example, C can have more than one point at infinity, and some of these points can be non-real. Therefore, if an unbounded closed semialgebraic set $K \subset C(\mathbb{R})$ is given, and one wants to conclude that the moment problem for K is not finitely solvable, one has to add conditions which imply that all points of C at infinity are real, and lie in the projective closure of K. For example, it is enough to assume that the monomial y^{n-1} occurs in $f(x, y)$, since then the projective closure of C in $\mathbb{P}^2$ is regular and has exactly one point on the line at infinity, which is real.

Department of Mathematics and Computer Science, Emory University, Atlanta, GA 30322, USA
E-mail address: vicki@mathcs.emory.edu

Fakultät für Mathematik, Universität Duisburg, 47048 Duisburg, Germany
E-mail address: claus@math.uni-duisburg.de