THE JOURNAL OF SYMBOLIC LOGIC
Volume 74, Number 4, Dec. 2009

CORRIGENDUM TO: "ON LASCAR RANK AND MORLEY RANK OF DEFINABLE GROUPS IN DIFFERENTIALLY CLOSED FIELDS"

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In [3], we proved

THEOREM. *Let T be an ω-stable theory of Morley rank ω^α. Suppose for any ordinal $1 \le \tau \le \alpha$ and integer $d \ge 1$, T^{eq} satisfies the condition:*

$$\textit{For any complete type } p\textit{, if } \mathrm{RM}(p) = \omega^\tau d \textit{ then } \mathrm{RU}(p) = \mathrm{RM}(p). \qquad (*)$$

Then Morley rank and U-rank agree for definable groups in T^{eq}.

We then claimed [3, Corollary 1.4] that m-DCF_0, the theory of characteristic 0 differentially closed fields with m commuting derivations, is an ω-stable theory satisfying $(*)$. However, our proof is not valid. The fallacy is that in justifying $(*)$ for m-DCF_0, we used in an essential way the following result[1] of McGrail [2, Theorem 5.2.2]

> *If p is a complete type over a model of m-DCF_0 with Δ-type τ and typical Δ-dimension a_τ, then $\omega^\tau a_\tau \le RU(p)$.*

which was shown to be false by Sonat Süer[5]. He constructed, for any $k \ge 1$, U-rank ω types in m-DCF_0 ($m \ge 2$) with Δ-type 1 and typical Δ-dimension k. Süer's counter-examples will appear in his forthcoming paper.

At this point, we would like to make two more remarks:

- Our proofs remain valid in the single derivation case. The second author showed that (Theorem 2.7 [4]) in DCF_0, if the Morley rank of a type is a limit ordinal then its Morley rank and U-rank coincide.
- Currently, we are not able to decide, for $m \ge 2$, whether m-DCF_0 satisfies $(*)$ or not. The examples given by Süer all have their Morley ranks and U-ranks equal. Hence they do not show that m-DCF_0 fails $(*)$.

REFERENCES

[1] E. R. KOLCHIN, ***Differential algebra and algebraic groups***, Pure and Applied Mathematics, vol. 54, Academic Press, New York–London, 1973.

[2] T. MCGRAIL, *The model theory of differentially closed fields with several commuting derivations*, this JOURNAL, vol. 65 (2000), no. 2, pp. 885–913.

Received January 25, 2008.

[1] The terminologies here are slightly different from those in [2]. See Remark 4.2.3 in [2] and pp. 129–130 in [1] for the translation between them.

1943-5886/09/7404-0019/$1.20