Arch. Math., Vol. 57, 416 (1991) 0003-889X/91/5704-0416 $ 1.70/0

Correction to "Frobenius non-classical curves"

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The proof of Proposition 5 of [3] is incomplete. With notation as in the paper, the possibility that the polynomial $X_0^{q/q'} P_0 + X_1^{q/q'} P_1 + X_2^{q/q'} P_2$ in (11) could be identically zero was overlooked. We will sketch here a proof that in this case X does not have controlled singularities so this case can indeed be discarded in the proof of Proposition 5.

Let $F = \sum_{i=0}^{2} X_i P_i^{q'}$ be a generic polynomial of this form with $\deg P_i = \lambda$, (so $d = \deg F = \lambda q' + 1$) with $\sum_{i=0}^{2} X_i^{q/q'} P_i$ identically zero. Thus every common zero of P_0 and P_1 is a zero of $X_2^{q/q'} P_2$ and, since we are in the generic case, is a zero of P_2 and gives a singular point of $F = 0$ with Jacobian ideal of multiplicity at least q' since $\partial F/\partial X_i = P_i^{q'}$. As there are generically λ^2 such points we get $\sum_{P \in X} e_P \geqq \lambda^2 q' > \frac{d}{2}$ and $F = 0$ does not have controlled singularities. As F was generic and controlled singularities is an open condition, the result follows.

Remark. Corollary (5.10) of [2] was improved in [1], Theorem 3, to guarantee, when $p > 2$, that the equation of a non-reflexive curve is of the form $\sum_{i=0}^{2} X_i P_i^{q'}$ if $\sum_{P \in X} e_P < d - 1$ rather than $\sum_{P \in X} e_P < \frac{1}{2} d$.

We would like to thank M. Homma who pointed out to us the case overlooked and suggested part of the above argument to show that any counterexample would be singular.

References

[1] E. BALLICO and A. HEFEZ, Non-reflexive projective curves of low degree. Manuscripta Math. **70**, 385–396 (1991).
[2] A. HEFEZ, Non reflexive curves. Compositio Math. **69**, 3–35 (1989).
[3] A. HEFEZ and J. F. VOLOCH, Frobenius non-classical curves. Arch. Math. **54**, 263–273 (1990).

Eingegangen am 31. 1. 1991

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