

# Pacific Journal of Mathematics

**CORRECTION TO: "ON EQUISINGULAR FAMILIES OF  
ISOLATED SINGULARITIES"**

AUGUSTO NOBILE

*Proof.* By Theorem 2.8 of [4] it suffices to show  $Q \otimes_R Re$  is a  $Q$  projective. Now we have  $0 \rightarrow Re \rightarrow Q$  exact and  $Q$  is flat over  $R$ , so  $0 \rightarrow Q \otimes Re \rightarrow Q \otimes Q$  is exact. The isomorphism  $Q \otimes Q \cong Q$  gives  $Q \otimes Re \cong Qe$ , and hence is  $Q$  projective.

**COROLLARY.** *For any idempotent  $e \in Q$ ,  $Re \cap R$  is a summand of  $R$ .*

*Proof.* The sequence  $0 \rightarrow Re \cap R \rightarrow R \rightarrow R(1 - e) \rightarrow 0$  splits.

We can now prove Proposition 3 of [2] for regular FPF rings. If  $L$  is a left ideal of  $R$ , then  $L$  is essential in a summand  $Qe$  of  $Q$ . Hence  $L$  is essential in  $Re$ , hence essential in  $Re \cap R$ , a summand of  $R$ .

#### REFERENCES

1. K. R. Goodeal, *Ring Theory*, Mono. and Text in Pure and Applied Math., **33**, Marcel Dekker, New York.
2. S. Page, *Regular FPF Rings*, Pacific J. Math., **79** (1978), 169-176.
3. ———, *Semi-prime and non-singular FPF rings*, to appear.
4. F. L. Sandomierski, *Nonsingular rings*, Proc. Amer. Math. Soc., **19** (1968), 225-230.

Correction to

## ON EQUISINGULAR FAMILIES OF ISOLATED SINGULARITIES

A. NOBILE

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Theorem 3.1 is incorrect. There are families of plane curves which are Zariski equisingular but do not satisfy condition  $\mathcal{E}$ . The error is in the proof of Lemma 3.5. In fact, as the example below shows, there are parametrized families of space curves, where the special fiber is not obtained by specializing the values of the parameters, but has embedded points. The arguments of the rest of the section are correct, and they give the following weaker result (we use the notations of the paper).

**THEOREM.** *Let  $(X_0, 0)$  be a germ of a reduced plane curve, with the following property: there is a representative  $\mathcal{V} = (\mathcal{Z}, X_\mu, D_\mu, \sigma)$  of the versal  $\mu$ -constant deformation of  $X_0$  such that for all  $u \in D_\mu$ ,  $f^{-1}(u)$  coincides with the  $H$ -transform of  $\mathcal{Z}^{-1}(u)$  where  $Z^\pi \rightarrow X_\mu$  is the*

*H*-transform of  $\mathcal{Y}$  and  $f$  is the composition  $\iota \circ \pi$ . Then, any deformation  $(\rho, X, Y, s)$  of  $X_0$  (with  $Y$  reduced) which is Zariski equisingular satisfies condition  $\mathcal{E}$ .

EXAMPLE. Consider the family of plane curves  $\mathcal{F} = (\rho, X, Y, \sigma)$  where  $X \subset \mathbb{C}^3$  is given parametrically by  $x = t^3, y = t^7 + ut^3, u \in Y = \mathbb{C}$  and  $\rho, \sigma$  are projection and trivial section respectively. If  $f = 0$  is an equation of  $X$ , by using the relation  $f_x x' + f_y y' = 0$  on  $X$  it is easy to verify that the *H*-transform  $Z$  of  $X$  is given parametrically (in  $\mathbb{C}^4$ ) by  $x = t^3, y = t^4 + ut^5, w = t^4 + (8/7)ut^5, u \in \mathbb{C}$ . Hence  $\mathcal{O} = \mathcal{O}_{Z_0,0} \approx \mathbb{C}\{t^3, t^4, ut^5\}$  and ( $q: Z \rightarrow Y$  being the canonical morphism and  $Z_0 = q^{-1}(0)$ )  $\mathcal{O}_{Z_0,0} \approx \mathbb{C}\{t^3, t^4, ut^5\}/u\mathbb{C}\{t^3, t^4, ut^5\}$ . But this local ring has depth zero:  $ut^5$  induces a nonzero divisor  $b \in \mathcal{O}_{Z_0,0}$ , such that  $b \cdot \max(\mathcal{O}_{Z_0,0}) = 0$  (in fact,  $ut^5 \cdot t^3 = ut^8 = u(t^4)^2, ut^5 \cdot t^4 = u(t^3)^3, (ut^5)^2 = u^2(t^3)^2 t^4$ , all these have image zero in  $\mathcal{O}_{Z_0,0}$ ). Now the family  $\mathcal{F}$  is Zariski equisingular (all fibers have  $(3; 7)$  as characteristic) but it does not satisfy condition  $\mathcal{E}$ ; if it did, by Theorem 2.4  $Z_0$  should be the *M*-transform of  $X_0$ , in particular reduced.

REMARK. For certain singularities of plane curves, Zariski equisingularity implies condition  $\mathcal{E} \cdot B \cdot g$ . This is the case for families of germs of curves of characteristic  $(n, n+1)$ . In this case the *H*-transform is nonsingular, and it is easy to verify our assertion. It would be interesting to characterize those characteristics for which both concepts agree.

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