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A COMPLEMENT TO THE PAPER "ON THE KOLÁŘ CONNECTION" [ARCH. MATH. (BRNO) 49 (2013), 223–240]

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On page 229 of [2], we have the following text

"From Corollary 19.8 in [1], we get immediately the following proposition

Proposition 1. *Let $p_Y\colon Y \to M$ be an $\mathcal{FM}_{m,n}$-object and $p_E\colon E \to M$ be a $\mathcal{VB}_{m,n}$-object, $y \in Y_x$, $x \in M$. Let $(\Gamma, \Lambda, \Phi, \Delta) \in Con(Y) \times Con^o_{clas}(M) \times Par(Y \times_M E) \times Con_{lin}(E)$. There exists a finite number $r = r(\Gamma, \Lambda, \Phi, \Delta, y)$ such that for any $(\Gamma_1, \Lambda_1, \Phi_1, \Delta_1) \in Con(Y) \times Con^o_{clas}(M) \times Par(Y \times_M E) \times Con_{lin}(E)$ we have the following implication*

$$\begin{aligned}(j^r_y\Gamma_1 = {}&j^r_y\Gamma\,,\ j^r_x\Lambda_1 = j^r_x\Lambda\,,\ j^r_y\Phi_1 = j^r_y\Phi\,,\ j^r_x\Delta_1 = j^r_x\Delta)\\ &\Rightarrow A(\Gamma_1, \Lambda_1, \Phi_1, \Delta_1)(y) = A(\Gamma, \Lambda, \Phi, \Delta)(y)\ ."\end{aligned}$$

One can show that the above proposition is true but it is not an immediate consequence of Corollary 19.8 in [1]. From Corollary 19.8, it follows immediately the following weaker result.

Proposition 1'. *Let $p_Y\colon Y \to M$ be an $\mathcal{FM}_{m,n}$-object and $p_E\colon E \to M$ be a $\mathcal{VB}_{m,n}$-object, $y \in Y_x$, $x \in M$. Let $(\Gamma, \Lambda, \Phi, \Delta) \in Con(Y) \times Con^o_{clas}(M) \times Par(Y \times_M E) \times Con_{lin}(E)$. There exists a finite number $r = r(\Gamma, \Lambda, \Phi, \Delta, y)$ such that for any $(\Gamma_1, \Lambda_1, \Phi_1, \Delta_1) \in Con(Y) \times Con^o_{clas}(M) \times Par(Y \times_M E) \times Con_{lin}(E)$ we have the following implications*

$$j^r_y\Gamma_1 = j^r_y\Gamma \Rightarrow A(\Gamma_1, \Lambda, \Phi, \Delta)(y) = A(\Gamma, \Lambda, \Phi, \Delta)(y)\,,$$

$$j^r_x\Lambda_1 = j^r_x\Lambda \Rightarrow A(\Gamma, \Lambda_1, \Phi, \Delta)(y) = A(\Gamma, \Lambda, \Phi, \Delta)(y)\,,$$

$$j^r_y\Phi_1 = j^r_y\Phi \Rightarrow A(\Gamma, \Lambda, \Phi_1, \Delta)(y) = A(\Gamma, \Lambda, \Phi, \Delta)(y)\,,$$

$$j^r_x\Delta_1 = j^r_x\Delta \Rightarrow A(\Gamma, \Lambda, \Phi, \Delta_1)(y) = A(\Gamma, \Lambda, \Phi, \Delta)(y)\,.$$

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One can easily see that by Proposition 1' we get the assumptions (2), (3), (4) and (5) on page 229 in [2]. Namely, by Proposition 1' we can replace Γ by Γ_1 being polynomial. Next by the same argument we can replace Λ by Λ_1 being polynomial. Next, by the same argument we can replace Φ by Φ_1 being polynomial. Next, by the same argument we can replace Δ_1 being polynomial.

Then using the same arguments as in [2] we obtain Lemma 4.1 of [2]. From Lemma 4.1 of [2] we get immediately Proposition 1.

So, we propose to replace Proposition 1 in [2] by Proposition 1'.

References

[1] Kolář, I., Michor, P. W., Slovák, J., *Natural Operations in Differential Geometry*, Springer Verlag, 1993.

[2] Mikulski, W.M., *On the Kolář connection*, Arch. Math. (Brno) **49** (2013), 223–240.

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