Journal of
Linear and Topological Algebra
Vol. 07*, No.* 01*,* 2018*,* 73- 74

Corrigendum to "On (σ, τ)-module extension Banach algebras"

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Received 3 October 2017; Revised 14 November 2017; Accepted 10 December 2017.

Communicated by Ghasem Soleimani Rad

Abstract. In this corrigendum, we give a correction of one result in reference [1].

Keywords: Banach algebra, module extension.

2010 AMS Subject Classification: 46H20, 46H25, 46H10, 47B48.

The proof of Theorem 2.4, part (ii) of [1] is not correct. Indeed, the proof of $I \times J \subseteq M$ is wrong, because we take $a_0 \in I$, $x_0 \in J$ and then conclude that

$$(a_\alpha, 0) \cdot (a_0, x_0) = (a_\alpha a_0, \sigma(a_\alpha) \cdot x_0) \to (a_0, x_0).$$

Our mistake happen here, since we assume that $(a_\alpha, 0) \cdot (a_0, x_0)$ is in M and closedness of M implied that $(a_0, x_0) \in M$. But, generally $(a_\alpha, 0) \cdot (a_0, x_0)$ is not in M.

But, if the left module action of X is zero, then we have $M = I \times J$. To see this, let $a_0 \in I$. So, there exists an $x \in X$ such that $(a_0, x) \in M$ and by $x_0 \in J$, there exists an $a \in A$ such that $(a, x_0) \in M$. Now

$$\begin{aligned}
&(a_\alpha, 0) \cdot (a_0, x) = (a_\alpha a_0, 0) \to (a_0, 0) \in M \\
&(a_\alpha, 0) \cdot (a, x_0) = (a_\alpha a, 0) \to (a, 0) \in M \\
&(a, x_0) - (a, 0) = (0, x_0) \in M.
\end{aligned}$$

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Print ISSN: 2252-0201
Online ISSN: 2345-5934

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Therefore, $(a_0, x_0) \in M$. Now, one can remove the hypothesis that $(\sigma(a_\alpha))$ is a left approximate identity for X.

Acknowledgements

The author would like to thank professor Abasalt Bodaghi who has pointed out this error and its correction.

References

[1] M. Fozouni, (σ, τ)-module extension Banach algebras, J. Linear. Topological. Algebra. 3 (04) (2014), 185-194.