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

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Professor Abasalt Bodaghi has informed me that 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

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

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

References

[1] M. Fozouni, *On (σ, τ)-module extension Banach algebras*, Journal of Linear and Topological Algebra, Vol. 03, No. 04, 2014, 185-194.

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