A GENERALIZATION OF THE WEAK AMENABILITY OF BANACH ALGEBRAS

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ABSTRACT. Let A be a Banach algebra and let φ and ψ be continuous homomorphisms on A. We consider the following module actions on A,

$$a \cdot x = \varphi(a)x, \qquad x \cdot a = x\psi(a) \qquad (a, x \in A).$$

We denote by $A_{(\varphi,\psi)}$ the above A-module. We call the Banach algebra A, (φ, ψ)-weakly amenable if every derivation from A into $(A_{(\varphi,\psi)})^*$ is inner. In this paper among many other things we investigate the relations between weak amenability and (φ, ψ)-weak amenability of A. Some conditions can be imposed on A such that the (φ'', ψ'')-weak amenability of A^{**} implies the (φ, ψ)-weak amenability of A.

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