

Amir Sahami

Generalized notions of amenability for a class of matrix algebras

Comment.Math.Univ.Carolin. 60,2 (2019) 199–208.

Abstract: We investigate the amenability and its related homological notions for a class of $I \times I$ -upper triangular matrix algebra, say $UP(I, A)$, where A is a Banach algebra equipped with a nonzero character. We show that $UP(I, A)$ is pseudo-contractible (amenable) if and only if I is singleton and A is pseudo-contractible (amenable), respectively. We also study pseudo-amenability and approximate biprojectivity of $UP(I, A)$.

Keywords: upper triangular Banach algebra; amenability; left φ -amenability; approximate biprojectivity

AMS Subject Classification: 46M10, 43A07, 43A20

REFERENCES

- [1] Aghababa H. P., Shi L. Y., Wu Y. J., *Generalized notions of character amenability*, Acta Math. Sin. (Engl. Ser.) **29** (2013), no. 7, 1329–1350.
- [2] Alaghmandan M., Nasr-Isfahani R., Nemati M., *On ϕ -contractibility of the Lebesgue-Fourier algebra of a locally compact group*, Arch. Math. (Basel) **95** (2010), no. 4, 373–379.
- [3] Choi Y., Ghahramani F., Zhang Y., *Approximate and pseudo-amenability of various classes of Banach algebras*, J. Funct. Anal. **256** (2009), no. 10, 3158–3191.
- [4] Dashti M., Nasr-Isfahani R., Soltani Renani S., *Character amenability of Lipschitz algebras*, Canad. Math. Bull. **57** (2014), no. 1, 37–41.
- [5] Dales H. G., Lau A. T.-M., Strauss D., *Banach algebras on semigroups and on their compactifications*, Mem. Amer. Math. Soc. **205** (2010), no. 966, 165 pages.
- [6] Duncan J., Paterson A. L. T., *Amenability for discrete convolution semigroup algebras*, Math. Scand. **66** (1990), no. 1, 141–146.
- [7] Esslamzadeh G. H., *Double centralizer algebras of certain Banach algebras*, Monatsh. Math. **142** (2004), no. 3, 193–203.
- [8] Forrest B. E., Marcoux L. W., *Derivations of triangular Banach algebras*, Indiana Univ. Math. J. **45** (1996), no. 2, 441–462.
- [9] Forrest B. E., Marcoux L. W., *Weak amenability of triangular Banach algebras*, Trans. Amer. Math. Soc. **354** (2002), no. 4, 1435–1452.
- [10] Ghahramani F., Loy R. J., *Generalized notions of amenability*, J. Funct. Anal. **208** (2004), no. 1, 229–260.
- [11] Ghahramani F., Loy R. J., Zhang Y., *Generalized notions of amenability. II*, J. Funct. Anal. **254** (2008), no. 7, 1776–1810.
- [12] Ghahramani F., Zhang Y., *Pseudo-amenable and pseudo-contractible Banach algebras*, Math. Proc. Cambridge Philos. Soc. **142** (2007), no. 1, 111–123.
- [13] Hu Z., Monfared M. S., Traynor T., *On character amenable Banach algebras*, Studia Math. **193** (2009), no. 1, 53–78.
- [14] Jabbari A., Abad T. M., Abadi M. Z., *On ϕ -inner amenable Banach algebras*, Colloq. Math. **122** (2011), no. 1, 1–10.
- [15] Kaniuth E., Lau A. T., Pym J., *On ϕ -amenability of Banach algebras*, Math. Proc. Cambridge Philos. Soc. **144** (2008), no. 1, 85–96.
- [16] Nasr-Isfahani R., Soltani Renani S., *Character contractibility of Banach algebras and homological properties of Banach modules*, Studia Math. **202** (2011), no. 3, 205–225.
- [17] Runde V., *Lectures on Amenability*, Lecture Notes in Mathematics, 1774, Springer, Berlin, 2002.
- [18] Sahami A., Pourabbas A., *Approximate biprojectivity of certain semigroup algebras*, Semigroup Forum **92** (2016), no. 2, 474–485.
- [19] Sahami A., *On biflatness and ϕ -biflatness of some Banach algebras*, Politehn. Univ. Bucharest Sci. Bull. Ser. A Appl. Math. Phys. **80** (2018), no. 1, 111–122.
- [20] Sahami A., Pourabbas A., *On ϕ -biflat and ϕ -biprojective Banach algebras*, Bull. Belg. Math. Soc. Simon Stevin **20** (2013), no. 5, 789–801.

- [21] Zhang Y., *Nilpotent ideals in a class of Banach algebras*, Proc. Amer. Math. Soc. **127** (1999), no. 11, 3237–3242.