DIFFERENT VERSIONS OF THE IMPRIMITIVITY THEOREM

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Abstract. In this paper we present different versions of the imprimitivity theorem hoping that this might become a support for the ones who are interested in the subject. We start with Mackey's theorem [26] and its projective version [29]. Then we remind Mackey's fundamental imprimitivity theorem in the bundle context [14]. Section 5 is dedicated to the imprimitivity theorem for systems of G-covariance [6]. In Section 6 and 7 we refer to the imprimitivity theorem in the context of C^*-algebras [39] and to the symmetric imprimitivity theorem [36], [42], [11].

Full text

References

[1] S. T. Ali, *Commutative systems of covariance and a generalization of Mackey's imprimitivity theorem*, Canad. Math. Bull., **27** (4) (1984), 390-397. MR0763033. Zbl 0596.22003.

[2] S.C. Bagchi, J. Mathew and M.G. Nadkarni, *On systems of imprimitivity on locally compact groups with dense actions*, Acta Math., **133** (1) (1974), 287-304. MR0419672(54 #7690). Zbl 0325.22003.

[3] R. J. Blattner, *Positive definite measures*, Proc. Amer. Math. Soc. **14** (1963), 423-428. MR0147580. Zbl 0135.36202.

[4] N. Bourbaki, *Eléments de mathématique. Livre V: Espaces vectoriels topologiques, Chaps. 3 à 5* (ASI 1229), Hermann, Paris (1967). MR0203425 (34 #3277). Zbl 0143.27101.

[5] H. H. Bui, *Morita equivalence of twisted crossed products by coactions*, J. Funct. Anal. **123** (1994), 59-98. MR1279296. Zbl 0815.46059.

[6] U. Cattaneo, *On Mackey's imprimitivity theorem*, Comment. Math. Helvetici **54** (1979), 629-641. MR0552681. Zbl 0425.22010.

[7] I. Colojoară , *Représentations des groupes localement compacts*, Université de Bucharest (1996).

[8] J. Dixmier, *Dual et quasi-dual d'une algèbre de Banach involutive*, Trans. Amer. Math. Soc. **104** (1962), 278-283. MR0139960. Zbl 0112.07302.

[9] J. Dixmier, *Les C*-algèbres et leurs représentations*, Gauthier-Villars, Paris, 1964.

[10] S. Echterhoff and I. Raeburn, *Multipliers of imprimitivity bimodules and Morita equivalence of crossed products*, Math. Scand. **76** (1995), 289-309. MR1354585. Zbl 0843.46049.

[11] S. Echterhoff and I. Raeburn, *Induced C*-algebras, coactions and equivariance in the symmetric imprimitivity theorem*, Math. Proc. Camb. Phil. Soc. **128** (2000), 327-342. MR1735301(2001g:46133). Zbl 0982.46053.

[12] S. Echterhoff, S. Kaliszewski, J. Quigg and I. Raeburn, *A categorial approach to imprimitivity theorems for C*-dynamical systems*, Memoirs of the Amer. Math. Soc., vol. **180**, No. 850 (2006).MR2203930(2007m:46107). Zbl 1097.46042.

[13] E. Effros and F. Hahn, *Locally compact transformation groups and C*-algebras*, Memoirs Amer. Math. Soc. **75** (1967). MR0227310(37 #2895). Zbl 0184.17002.

[14] J. M. G. Fell, *An extension of Mackey's method to Banach *-algebras bundles*, Memoir Amer. Math. Soc., **90** (1969). MR0247469(40 #735). Zbl 0194.44301.

[15] J. M. G. Fell, *A new look at Mackey's imprimitivity theorem*, Lecture Notes in Mathematics, Springer Berlin, **266** (1972), 43-58. MR0409719. Zbl 0234.43008.

[16] J. Glimm, *Families of induced representations*, Pacific J. Math. **12** (1962), 885-911.MR0146297. Zbl 0121.10303.

[17] E. C. Gootman and J. Rosenberg, *The structure of crossed product C*-algebras: a proof of the generalized Effros-Hahn conjecture*, Invent. Math. **52** (1979), 283-298. MR0537063(80h:46091). Zbl 0405.22005.

[18] P. Green, *The local structure of twisted covariance algebras*, Acta Math. **140** (1978), 191-250. MR0493349. Zbl 0407.46053.

[19] P. Green, *The structure of imprimitivity algebras*, J. Funct. Anal. **36** (1980), 88-104. MR0568977. Zbl 0422.46048.

[20] P. R. Halmos, *Measure Theory*, Van Nostrand, Princeton (1950). MR0033869. Zbl 0040.16802.

[21] A. an Huef, I. Raeburn and D.P. Williams, *An equivariant Brauer semigroup and the symmetric imprimitivity theorem*, Trans. Amer. Math. Soc., vol. **352**, No. 10 (2000), 4759-4787. MR1709774(2001b:46107). Zbl 1001.46044.

[22] A. an Huef and I. Raeburn, *Regularity of induced representations and a theorem of Quigg and Spielberg*, Math. Proc. Camb. Phil. Soc. **133** (2002), 249-259. MR1912400 (2003g:46080). Zbl 1030.46064.

[23] A. an Huef, I. Raeburn and D. P. Williams, *Proper actions on imprimitivity bimodules and decompositions of Morita equivalences*, J. of Func. Anal. **200** (2003), 401-428. MR1979017(2004j:46089). Zbl 1031.46068.

[24] G. G. Kasparov, *Equivariant KK-theory and the Novikov conjecture*, Invent. Math. **91** (1988), 147-201. MR0918241. Zbl 0647.46053.

[25] E. C. Lance, *Hilbert C^*-modules. A toolkit for operator algebraists*, London Mathematical Society Lecture Note Series **210**, Cambridge University Press, Cambridge (1995). MR1325694(96k:46100). Zbl 0822.46080.

[26] G. W. Mackey, *Imprimitivity for representations of locally compact groups I*, Proc. Nat. Acad. Sci. USA **35** (1949), 537-545. MR0031489. Zbl 0035.06901.

[27] G.W. Mackey, *Induced representations of locally compact groups I*, Ann. Math. **55** (1952), 101-139. MR0044536. Zbl 0046.11601.

[28] G.W. Mackey, *Borel structure in groups and their duals*, Trans. Amer. Math. Soc. **85** (1957), 134-165. MR0089999. Zbl 0082.11201.

[29] G.W. Mackey, *Unitary representations of group extensions, I*, Acta Math. **99** (1958), 265-311. MR0098328. Zbl 0082.11301.

[30] G.W. Mackey, *A remark on systems of imprimitivity*, Math. Ann. **145** (1962), 50-51. MR0139688. Zbl 0126.06102.

[31] M. A. Neumark, *On a representation of additive operator set function*, C. R. (Doklady) Acad. Sci. URSS **41** (1943), 359-361. MR0010789. Zbl 0061.25410.

[32] B. Ørsted, *Induced representations and a new proof of the imprimitivity theorem*, J. of Func. Anal. **31** (1979), 355-359. MR0531137. Zbl 0402.22004.

[33] D. Pask and I. Raeburn, *Symmetric imprimitivity theorems for graph C^*-algebras*, Internat. J. of Math., **12**, No. 5 (2001), 609-623. MR1843869. Zbl 1116.46305.

[34] J. Phillips and I. Raeburn, *Twisted crossed products by coactions*, J. Austral. Math. Soc. (Series A) **56** (1994), 320-344. MR1271525(95e:46079). Zbl 0805.46067.

[35] J. C. Quigg and J. Spielberg, *Regularity and hyporegularity in C^*-dynamical systems*, Houston J. Math. **18** (1992), 139-152. MR1212711(93c:46122). Zbl 0785.46052.

[36] I. Raeburn, *Induced C^*-algebras and a symmetric imprimitivity theorem*, Math. Ann. **280** (1988), 369-387. MR0936317(90k:46144). Zbl 0617.22009.

[37] C. E. Rickart, *General theory of Banach algebras*, Van Nostrand, Princeton, 1960, MR0115101. Zbl 0095.09702.

[38] M. A. Rieffel, *Induced representations of C^*-algebras*, Bull. Amer. Math. Soc., **78**, No. 4 (1972), 606-609. MR0301519(46 #677). Zbl 0256.22011.

[39] M. A. Rieffel, *Induced representations of C^*-algebras*, Adv. Math. **13** (1974), 176-257. MR0353003(50 #5489). Zbl 0284.46040.

[40] M. A. Rieffel, *Strong Morita equivalence of certain transformation group C^*-algebra*, Math. Ann. **222** (1976), 7-22. MR0419677(54 #7695). Zbl 0328.22013.

[41] M.A. Rieffel, *Applications of strong Morita eqivalence to transformation group C^*-algebras*, Operator algebras and applications. Proc. Symposia in Pure Math., vol. **38**, Part 1, p. 299-310. Am. Math. Soc., Priovidence 1982. MR679709(84k:46046). Zbl 0526.46055.

[42] D. Williams, *Crossed Products of C^*-algebras*, Mathematical Surveys and Monographs, Vol. **134** (2007). MR2288954(2007m:46003). Zbl 1119.46002.

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