

**CHARACTERIZATION OF THE ORDER RELATION  
ON THE SET OF COMPLETELY  $n$ -POSITIVE  
LINEAR MAPS BETWEEN  $C^*$ -ALGEBRAS**

Maria Joița, Tania-Luminița Costache and Mariana Zamfir

**Abstract.** In this paper we characterize the order relation on the set of all nondegenerate completely  $n$ -positive linear maps between  $C^*$ -algebras in terms of a self-dual Hilbert module induced by each completely  $n$ -positive linear map.

[Full text](#)

**References**

- [1] J. Heo, *Completely multi-positive linear maps and representation on Hilbert  $C^*$ -modules*, J. Operator Theory **41** (1999), 3-22. [MR1675235\(2000a:46103\)](#). [Zbl 0994.46019](#).
- [2] M. Joița, *A Radon-Nikodym theorem for completely multi-positive linear maps and its applications*, Topological algebras and applications, Contemp. Math. **427** (2007), 235–245. [MR2326359](#). [Zbl pre05180876](#).
- [3] M. Joița, T.-L. Costache, M. Zamfir, *Representations associated with completely  $n$ -positive linear maps between  $C^*$ -algebras*, Stud. Cercet. Stiint., Ser. Mat. **16** (2006), Supplement Proceedings of ICMI 45, Bacău, Sept. 18-20, 2006, 111-122. [MR2318951](#).
- [4] M. Joița, T.-L. Costache, M. Zamfir, *On the order structure on the set of completely multi-positive linear maps on  $C^*$ -algebras* (submitted).
- [5] 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](#).

---

2000 Mathematics Subject Classification: 46L05; 46L08

Keywords: Hilbert module,  $C^*$ -algebra, completely  $n$ -positive linear map, extreme points

*This research was supported by CNCSIS grant code A 1065/2006.*

\*\*\*\*\*

<http://www.utgjiu.ro/math/sma>

- [6] H. Lin, *Bounded module maps and pure completely positive maps*, J. Operator Theory **26** (1991), 121-139. [MR1214924\(92h:35103\)](#). [Zbl 0791.46032](#).
- [7] W. L. Paschke, *Inner product modules over  $B^*$ -algebras*, Trans. Amer. Math. Soc. **182** (1973), 443-468. [MR0355613\(50 #8087\)](#). [Zbl 0239.46062](#).
- [8] C. Y. Suen, *An  $n \times n$  matrix of linear maps of a  $C^*$ -algebra*, Proc. Amer. Math. Soc. **112** (1991), no.3, 709-712. [MR1069296\(92a:46069\)](#). [Zbl 0755.46024](#).
- [9] S. K. Tsui, *Completely positive module maps and completely positive extreme maps*, Proc. Amer. Math. Soc. **124** (1996), 437-445. [MR1301050\(96d:46074\)](#). [Zbl 0846.46037](#).

Maria Joița  
Department of Mathematics,  
Faculty of Chemistry,  
University of Bucharest,  
Romania.  
e-mail: mjoita@fmi.unibuc.ro

Tania - Luminita Costache  
Faculty of Applied Sciences,  
University "Politehnica",  
Bucharest,  
Romania.  
e-mail: lumycos@yahoo.com

Mariana Zamfir  
Department of Mathematics and Informatics  
Technical University of Civil Engineering Bucharest  
Romania.  
e-mail: zacos@k.ro

\*\*\*\*\*