



Contents lists available at ScienceDirect

Finite Fields and Their Applications

www.elsevier.com/locate/ffa



Perfect codes in poset spaces and poset block spaces

B.K. Dass^a, Namita Sharma^{a,*}, Rashmi Verma^b^a Department of Mathematics, University of Delhi, Delhi 110 007, India^b Mata Sundri College for Women, University of Delhi, Mata Sundri Lane, Delhi 110 002, India

ARTICLE INFO

Article history:

Received 23 February 2016

Received in revised form 29

December 2016

Accepted 24 February 2017

Available online xxx

Communicated by Iwan Duursma

MSC:

94B05

94B60

Keywords:

Poset metric

Poset block metric

Perfect code

ABSTRACT

The paper begins by giving a counter example to show that the algorithm for construction of new perfect poset codes from a given perfect poset code by removal of a coordinate as given by Lee (2004) [11] does not hold. The algorithm has been improved and generalized to obtain new perfect poset block codes from a given perfect poset block code. The modified necessary and sufficient conditions for the construction of new perfect poset codes have been derived as a particular case. A bound has been obtained on the height of poset P_r that turns a given π -code into r -perfect (P_r, π) -code. We show that there does not exist a poset which admits the binary Simplex code of order 3 to be a 2-perfect poset code. Also, all the poset structures which admit the extended ternary Golay code to be a 3-perfect poset code have been classified.

© 2017 Elsevier Inc. All rights reserved.

* Corresponding author.

E-mail addresses: dassbkt@rediffmail.com (B.K. Dass), namita01sharma@gmail.com (N. Sharma), rashmiv710@gmail.com (R. Verma).

¹ Supported by Senior Research Fellowship Grant AA/139/E-177 of University Grants Commission.