

Banach J. Math. Anal. 8 (2014), no. 1, 89–97

 ${f B}$ anach  ${f J}$ ournal of  ${f M}$ athematical  ${f A}$ nalysis

ISSN: 1735-8787 (electronic)

www.emis.de/journals/BJMA/

## ORTHONORMAL BASES AND A STRUCTURE OF FINITE DIMENSIONAL NORMED LINEAR SPACES

## RYOTARO TANAKA $^1$ AND KICHI-SUKE SAITO $^{2*}$

Communicated by D. Bakić

ABSTRACT. In this paper, we consider orthonormal bases for finite dimensional normed linear spaces which are related to Birkhoff orthogonality. We also study the relationship between orthonormal bases and a structure of finite dimensional normed linear spaces.

 $E ext{-}mail\ address: ryotarotanaka@m.sc.niigata-u.ac.jp}$ 

E-mail address: saito@math.sc.niigata-u.ac.jp

Date: Received: 8 April 2013; Accepted: 28 April 2013.

Key words and phrases. Birkhoff orthogonality, orthonormal basis, normed linear space.

<sup>&</sup>lt;sup>1</sup> Department of Mathematical Science, Graduate School of Science and Technology, Niigata University, Niigata 950-2181, Japan.

 $<sup>^2</sup>$  Department of Mathematics, Faculty of Science, Niigata University, Niigata 950-2181, Japan.

<sup>\*</sup> Corresponding author.

<sup>2010</sup> Mathematics Subject Classification. Primary 46B20; Secondary 46B25.