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CERTAIN PROPERTIES ASSOCIATED WITH SCHAUDER FRAMES IN BANACH SPACES

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Abstract. Schauder frames satisfying property (I) and property (II) has been defined and studied. It has been proved that an atomic decomposition satisfies property (I) if and only if it satisfies property (II). Also, Schauder frames satisfying property $(\mathcal{M})$ has been defined and it has been proved that, in a uniformly convex Banach space, if a Schauder frame satisfies property $(\mathcal{M})$, then it also satisfies property (II) (and hence property (I)). Further, we define atomic decompositions satisfying property $(\mathcal{B})$ and prove that property $(\mathcal{B})$ is a necessary condition for an atomic decomposition satisfying property (I). Finally, we define property $(\mathcal{SB})$ for a Schauder frame and gave a necessary condition for it.

1. Introduction

Frames for Hilbert spaces were formally introduced by Duffin and Schaeffer [7] and reintroduced by Daubechies et al. [6]. Today, frames are main tools for use in signal and image processing, compression, sampling theory, optics, filter banks, signal detection etc.

Coifman and Weiss [5], introduced the notion of atomic decompositions for function spaces. Later, Feichtinger and Gröchenig [8] extended the notion of atomic decomposition to Banach spaces. Gröchenig [9] introduced a more general concept for Banach spaces called Banach frame. Retro Banach frames for dual Banach spaces were introduced and studied in [12] and the notion of Weak*-Schauder frames for dual Banach spaces were introduced and studied in [14]. In [3], Casazza, et al. gave various definitions of frames for Banach spaces including that of Schauder frame. Later, Han and Larson [10] defined Schauder frame for a Banach space. In 2008, Casazza, et al. [2] studied the coefficient quantization of Schauder frames in Banach spaces. Liu [15] gave the concepts of minimal and maximal associated bases with respect to Schauder frames and closely connected them with the duality theory. In [17], Liu and Zheng gave a characterization of Schauder frames which are near-Schauder bases. Infact, they

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