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G- FRAMES AND THEIR STABILITY IN HILBERT SPACE

K. N. Rajeswari and Neelam George

School of Mathematics,
D. A. V. V., Indore - 452001, Madhya Pradesh, INDIA

E-mail : knr_k@yahoo.co.in, neelamdonneygeorge@gmail.com

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Abstract: W. Sun in his paper [W. Sun, G-frames and g-Riesz bases. J. Math. Anal. Appl 322 (2006),437-452] has introduced g-frames which are generalized frames and cover many recent generalizations of frames such as bounded quasi-projections, fusion frames and pseudo-frames. We give a necessary and sufficient condition for a g-frame to be a dual to a given g-frame and obtain some sufficient conditions under which sequences are stable under small perturbations.

Keywords and Phrases: G-frames, dual g-frames, orthogonal g-frames, g-R-dual sequence.

2020 Mathematics Subject Classification: 42C15.

1. Introduction

Frames in Hilbert spaces have been introduced in 1952 by J. Duffin and A. C. Schaeffer [5] while studying non harmonic Fourier series. The work of Daubechies, Grossmann and Meyer [4] in 1986 reintroduced the frames.

In [11], W. Sun introduced the concept of generalized frames (or g-frames) in Hilbert spaces, which are generalizations of frames and cover many other recent generalizations of frames such as bounded quasi-projections, fusion frames, and pseudo frames. Study of stability of frames and g-frames under small perturbation is also important in applications. Finding the conditions under which a g-frame close to a given g-frame is also a g-frame is called stability problem. Stability of g-frames and dual g-frames has been given by W. Sun. [12] and subsequently developed by many other authors [1, 7, 8, 10]. In this paper we give a necessary