1056-41-1114 **Rong-Qing Jia*** (`rjia@ualberta.ca`), Department of Mathematical Sciences, Unniversity of Alberta, CAB 632, Edmonton, Alberta T6G 2G1, Canada. *Spectral Properties of the Transition Operators Associated with Box Splines.* Preliminary report.

We investigate Riesz bases generated from box splines. This investigation leads us to a study of refinement equations with masks being exponentially decaying sequences. Various properties of Riesz bases and their dual bases can be characterized by the spectral properties of the transition operators associated with the refinement masks. It turns out that the transition operator associated with an exponentially decaying mask is a compact operator on a certain Banach space of sequences. Moreover, an order structure can be introduced so that the relevant transition operator is a positive operator. Furthermore, when the refinement mask is induced by box splines, by using the algebraic properties of box splines, we demonstrate that the transition operator is strongly positive in many cases of interest to applications. By invoking the theory of compact positive operators we design efficient algorithms to calculate desirable eigenvalues of the transition operator. The theory and numerical computation developed in our work will be important for the study of Riesz bases and their dual bases associated with box splines. (Received September 21, 2009)

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