

**CARLESON MEASURES, TREES, EXTRAPOLATION,
AND $T(b)$ THEOREMS**

P. AUSCHER, S. HOFMANN, C. MUSCALU, T. TAO AND C. THIELE

Abstract

The theory of Carleson measures, stopping time arguments, and atomic decompositions has been well-established in harmonic analysis. More recent is the theory of phase space analysis from the point of view of wave packets on tiles, tree selection algorithms, and tree size estimates. The purpose of this paper is to demonstrate that the two theories are in fact closely related, by taking existing results and reproving them in a unified setting. In particular we give a dyadic version of extrapolation for Carleson measures, as well as a two-sided local dyadic $T(b)$ theorem which generalizes earlier $T(b)$ theorems of David, Journé, Semmes, and Christ.

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