

WAVE PACKET TRANSFORMS OVER FINITE FIELDS*

A. GHAANI FARASHAH†

Abstract. This article introduces the abstract notion of finite wave packet groups over finite fields as the finite group of dilations, translations, and modulations. Then it presents a unified theoretical linear algebra approach to the theory of wave packet transforms (WPT) over finite fields. It is shown that each vector defined over a finite field can be represented as a finite coherent sum of wave packet coefficients as well.

Key words. Finite field, Wave packet group, Wave packet representation, Wave packet transform, Dilation operator, Periodic (finite size) data, Prime integer.

AMS subject classifications. 42C40, 12E20, 13B05, 12F10, 81R05, 20G40.

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†Numerical Harmonic Analysis Group (NuHAG), Faculty of Mathematics, University of Vienna (arash.ghaani.farashahi@univie.ac.at, ghaanifarashahi@hotmail.com).