1172-43-231   **Hartmut Fuehr***, Lehrstuhl A für Mathematik, RWTH Aachen, 52064 Aachen, NRW, Germany.
Phase retrieval for affine groups over prime fields. Preliminary report.

We present a construction of tight frames with guaranteed phase retrieval properties, using the theory of unitary group representations.

The chief example known in this domain relies on finite Heisenberg groups, and provides phase retrieval methods for the finite windowed Fourier transform. In fact, as observed by Bojarovska and Flinth, the retrieval methods allow the recovery of arbitrary matrices from their Frobenius scalar products with the family of rank-one operators associated to a finite Gabor system, under suitable assumptions on the spreading function of the window.

We perform a similar analysis for finite affine groups over prime fields, which are associated to finite wavelet transforms, and derive explicit phase retrieval formulas for these transforms. We establish sharp criteria for the analyzing wavelet to allow matrix recovery, and exhibit explicit examples of wavelets fulfilling these criteria.

(Joint work with David Bartusel (RWTH Aachen) and Vignon Oussa (Bridgewater State University, USA). (Received August 30, 2021)