

The generalized Prony method

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In recent years, Prony's method and Prony-like methods have been successfully applied to different inverse problems. The goal of Prony's and Prony-like methods is the reconstruction of sparse exponential expansions using only a suitable number of functional values. In this talk we want to present the generalized Prony method, which extends the original Prony method to the reconstruction of sparse exponential expansions of eigenfunctions of suitable linear operators. We look at different operators with which we are able to reconstruct functions, which are a linear combination of exponential functions, and compare them with the original Prony method in terms of numerical stability. Additionally, we compare different reconstructions of sparse monomial expansions and sparse expansions of orthogonal polynomials such as the Chebyshev polynomials.

References

- [1] G. Plonka and T. Peter. *A generalized Prony method for reconstruction of sparse sums of eigenfunctions of linear operators*. *Inverse Problems* 29, 025001, 2013.