

# $(\beta, \gamma)$ -Chebyshev functions and points and their usage in constructing stable mapped bases

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## 1 Abstract e references (max. 1 pagina)

Very recently, we introduced the class of  $(\beta, \gamma)$ -Chebyshev functions and corresponding points, which can be seen as a family of generalized Chebyshev polynomials and points [1]. In this talk, we present some results concerning this new class of functions, proving that they are orthogonal in certain subintervals of  $[-1, 1]$  with respect to a weighted arc-cosine measure. Moreover, we show that subsets of Chebyshev and Chebyshev-Lobatto points are instances of  $(\beta, \gamma)$ -Chebyshev points, and we present the behavior of the Lebesgue constants of the polynomial interpolant at these points on varying the parameters  $\beta$  and  $\gamma$ . Then, by considering the so-called Fake Nodes Approach (FNA) [2], we investigate the application of  $(\beta, \gamma)$ -Chebyshev points in the construction of mapped bases that are not affected by Runge's and Gibbs phenomena.

## References

- [1] S. DE MARCHI, G. ELEFANTE, F. MARCHETTI, *On  $(\beta, \gamma)$ -Chebyshev functions and points of the interval*, submitted.

- [2] S. DE MARCHI, F. MARCHETTI, E. PERRACCHIONE, D. POGGIALI, *Polynomial interpolation via mapped bases without resampling*, J. Comput. Appl. Math., **364** (2020), 112347–12.