Title: On the study of the kernel of singular integral operators with non-Carleman shift using Mathematica software.

Author: Rui Marreiros.

Abstract: On the Hilbert space $L_2(\mathbb{T})$, $\mathbb{T}$ is the unit circle, we consider some classes of singular integral operators with non-Carleman shift and conjugation, and estimates obtained for the dimension of the kernel of these operators. We show how symbolic computation can be used to built some nontrivial examples to clarify and illustrate the previous theoretical results.

References:

1) Conceição, A. C., Marreiros, R. C., and Pereira, J. C. Symbolic computation applied to the study of the kernel of a singular Integral operator with non-Carleman shift and conjugation. Mathematics in Computer Science, Vol. 10, N 3, 365-386, Birkhauser Verlag, Basel, 2016.

2) Conceição, A. C. and Marreiros, R. C.: On the kernel of a singular integral operator with non-Carleman shift and conjugation. Operators and Matrices, Vol. 9, N 2, 433-456, Zagreb, Croatia, 2015.

3) Kravchenko, V. G.; Marreiros, R. C. and Rodriguez, J. S.: An estimate for the number of solutions of an homogenous generalized Riemann boundary value problem with shift. Recent Progress in Operator Theory and its Applications; Operator Theory: Advances and Applications, Vol. 220, 163-178. Birkhauser Verlag, Basel, 2012.

4) Marreiros, R. C.: On the study of the dimension of the kernel of singular integral operators with non-Carleman shift using Mathematica software. Proceedings of the 1st National Conference on Symbolic Computation in Education and Research, Instituto Superior Tecnico, Lisboa, April 2-3, 2012. ID-08, Congress Centre, Lisboa, 2012.