## Numerical Caputo differentiation by radial basis functions

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Previously, based on the method of (radial powers) radial basis functions, we proposed a procedure for approximating derivative values from one-dimensional scattered noisy data. In this work, we show that the same approach also allows us to approximate the values of (Caputo) fractional derivatives (for orders between 0 and 1). With either a priori or a posteriori strategy of choosing the regularization parameter, our convergence analysis shows that the approximated fractional derivative values converge at the same rate as in the case of integer order 1.

Key Words: fractional derivatives, radial basis function, inverse problem, posteriori strategy