

## **Non-symmetric fractional operators as special cases of nonlocal convection-diffusion operators: analysis and applications.**

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We consider a general class of nonlocal convection-diffusion (NCD) operators with finite interaction radius on bounded domains. With minimal assumptions on the model parameters and by means of the nonlocal vector calculus, we show that the associated weak form is well-posed and that non-symmetric fractional operators are special instances of NCD operators.

Also, for the case of the fractional Laplacian operator, we derive rates of convergence of solutions of the nonlocal problem to solutions of the fractional one and we illustrate the theory with several numerical tests.

Finally, as an application, we consider finite-range jump processes and show that the NCD operator is the generator of finite- and infinite-activity Levy and Levy-type jump processes.