FUNCTIONAL CALCULUS AND A LINK TO FRACTIONAL CALCULUS

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Dedicated to Francesco Mainardi on the occasion of his 60 th birthday

Abstract

In this paper we sketch the state of the art of our *functional calculus* approach to non-integer differentiation. In particular, its generalization to distributional spaces is described. A generalization of the law for differentiating convolutions is used to show that this approach coincides for certain classes of "admissible" functions with the definition via *Riemann–Liouville* integrals as well as via *Caputo* integrals with lower bounds $-\infty$.

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