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## Reconstruction of a singular source in a fractional subdiffusion problem from a single point measurement

**Abstract.** In this talk, we reconstruct a singular time dependent source function of a fractional subdiffusion problem using observational data obtained from a single point of the boundary and inside of the domain. Specifically, the singular function under consideration is represented by the Dirac delta function which makes the analysis interesting as the temporal component of unknown source belongs to a Sobolev space of negative order. We establish the uniqueness of the examined inverse problem in both scenarios. In addition, we analyze local stability of the solution of our inverse problem. To numerically reconstruct a point-wise source, we use the techniques of topological derivatives by converting the inverse source problem in an optimization one. More precisely, we develop a second-order non-iterative reconstruction algorithm to achieve our goal. The efficacy of the proposed approach is substantiated through diverse numerical examples.