Existence of weak solution for a non-linear parabolic problem with fractional derivates

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The main objective of this work is to demonstrate the existence and unique of weak solution for a nonlinear parabolic problem with fractional derivatives for the spatial and temporal variables on a one-dimensional domain. Using the Nehari Manifold method and its relationship with the Fibering Maps, the existence of a weak solution for the stationary case was demonstrated. Finally, using the Arzela-Ascoli Theorem and Banach’s Fixed Point Theorem, the existence and uniqueness of a weak solution for the non-linear parabolic problem were shown.

Keywords — Fractional Calculus , Nehari Manifold , Fibering Maps weak Solution

References


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