



Seminario Rubio de Francia

Conferencia

por

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Título:

*Analysis and approximation of a weakly singular Volterra integral
equation with nonlinear exponent*

Resumen: A weakly singular Volterra integral equation (VIE) whose kernel has a nonlinear exponent $\alpha(u(s))$ is considered. After showing the compactness of the nonlinear Volterra integral operator, we apply Schaefer's fixed-point theorem to establish existence of a continuous solution $u(t)$ to the VIE. Uniqueness and regularity of this solution are then proved; it has a weak singularity at the initial time $t = 0$ that is characterised by $\alpha(u(0))$. A nonlinear collocation method is constructed on uniform and graded meshes. Well-posedness and stability of this method are shown, and an estimate of its error, which is sharp up to a log factor, is derived using completely novel techniques. Numerical experiments support the theoretical findings.

El seminario se podrá seguir en directo a través del enlace:

<https://www.youtube.com/@seminariorubiodefrancia>

Fecha: Jueves, 4 de diciembre de 2025.

Hora: 12:10 horas.

Lugar: seminario Rubio de Francia, edificio de Matemáticas, primera planta.

Web: <http://anamat.unizar.es/seminario.html>