Embedding Schwartz Distributions in $C^{\infty}(R^n, R)$ with R an ultra metric algebra

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In honour of Prof. Paulo Ribenboim
Birthday and Un –Birthday

Collaborators

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A Non-Linear Parabolic Equation
Equation
Brézis – Friedman

$$\begin{cases} u_t - \Delta u + u^3 = 0 \quad , \quad in\ Q = \Omega \times \,]0,T[\\ u(x,t) = 0 \ , \qquad in\ \partial\Omega \times \,]0,T[\\ u(x,0) = \delta(x) \ , \qquad in\ \ \Omega \end{cases}$$

Distributional sense

$$\lim_{t \to 0} \left(\lim_{\varepsilon \to 0} \int_{\Omega} u_{\varepsilon}(x,t) \varphi(x) dx \right) = 0$$

$$\forall \ \varphi \in \mathcal{D}'(\Omega)$$

Generalized Functions

$$\lim_{\varepsilon \to 0} \left(\lim_{t \to 0} \int_{\Omega} u_{\varepsilon}(x,t) \varphi(x) dx \right) = \delta(0)$$

$$\forall \ \varphi \in \mathcal{D}'(\Omega)$$

THANK YOU !