Title: Soluciones periódicas de ecuaciones diferenciales de segundo orden en espacios de Banach.

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Resumen.

In this talk we deal with the existence of solutions for the following second order differential equation:

$$\begin{cases} u''(t) = f(t, u(t)) + h(t) \\ u(a) - u(b) = u'(a) - u'(b) = 0, \end{cases}$$

where $\mathbb{B}$ is a reflexive real Banach space, $f : [a, b] \times \mathbb{B} \to \mathbb{B}$ is a sequentially weak-strong continuous mapping and $h : [a, b] \to \mathbb{B}$ is a integrable function on $\mathbb{B}$. Finally, we present some examples of application of the general result. In particular, we study the existence of solution for the following partial differential equation:

Let Ω be an open convex and bounded subset of $\mathbb{R}^n$ and consider $\rho : [a, b] \times \Omega \to \mathbb{R}$ a function.

$$\begin{cases} \displaystyle\sum_{i=1}^{n} \frac{\partial^2}{\partial x_i^2} \left(\frac{\partial^2 \phi}{\partial t^2}(t, x) - \rho(t, x) \right) = \phi(t, x) \text{ in } (a, b) \times \Omega, \\ \phi(a, x) - \phi(b, x) = \dfrac{\partial \phi}{\partial t}(a, x) - \dfrac{\partial \phi}{\partial t}(b, x) = 0 \text{ in } \Omega, \\ \dfrac{\partial^2 \phi}{\partial t^2}(t, x) - \rho(t, x) = 0 \text{ on } (a, b) \times \partial\Omega. \end{cases}$$