

## Leray-Lions Operators and Renormalized Solutions

(3 Lectures)

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### Monotone operators in a Banach space

- Abstract setting
- Maximal monotone operators
- Galerkins approximation
- Surjectivity
- Pseudomonotone operators
- Variational inequalities

### The Leray-Lions operators

- Definition
- Resolution of  $u \in W_0^{1,p}(\Omega)$ ,  $-\operatorname{div} a(x, Du) = f$  in  $\mathcal{D}'(\Omega)$  for any given  $f \in W^{-1,p'}(\Omega)$
- Strong convergence of the Galerkins approximations in  $W_0^{1,p}(\Omega)$

### Renormalized solutions for right hand sides in $L^1(\Omega)$

- Definition
- Strong convergence of  $T_k(u^\epsilon)$  for  $k$  fixed
- Existence and uniqueness of a renormalized solution