G. Da Prato, Maximal L^2 regularity for Dirichlet problems in open sets of Hilbert spaces.

In this talk we shall present some recent results about maximal $L^2(H,\mu)$ regularity for the problem

$$\begin{cases} \lambda U - \mathscr{L}U = F, \quad \text{in } \mathscr{O}, \\ \\ U = 0, \quad \text{on } \partial\mathscr{O}, \end{cases} \tag{E}$$

where

$$\mathscr{L}U = \frac{1}{2}\text{Tr }[QD^2U] - \frac{1}{2}\langle x, DU\rangle$$

and $\mu = N_Q$.

Here Q is a symmetric, positive, trace class operator and μ is the Gaussian measure in H with mean 0 and covariance Q. $\lambda > 0$ and $F \in L^2(H,\mu)$ are given.

$\mathscr{L}$ is the Kolmogorov operator corresponding to the stochastic differential equation

$$dX(t,x) = -\frac{1}{2}X(t,x)dt + Q^{1/2}dW(t), \quad X(0,x) = x, \qquad (SPDE).$$

$X(t,x)$ is the Ornstein–Uhlenbeck process of the Malliavin Calculus.

Finally, $\mathscr{O}$ is an open set of H with regular boundary of the form

$$\mathscr{O} = \{x \in H :\ G(x) < 0\}$$

and

$$\partial\mathscr{O} = \{H \in X :\ G(x) = 0\}.$$

We shall follow the paper

DP-A. Lunardi, Maximal L^2 regularity for Dirichlet problems in Hilbert spaces, arXiv:1201.3809, J. Math. Pures Appl. to appear.