962-60-893 **Frederi G Viens*** (viens@purdue.edu), Dept. Math. and Dept. Stat., 1399 Math Sci Bldg, Purdue University, West Lafayette, IN 47907, and **Jorge A Leon** and **Samy Tindel**. *Regularity conditions and Lyapunov exponents for stochastic partial differential equations with random coefficients.* Preliminary report.

Joint work in progress with S. Tindel, and with J.A. Leon. We consider a parabolic stochastic PDE on a compact smooth manifold M – for example the circle group. The second order differential operator L may have random adapted coefficients. One goal is to show that when L is almost-surely uniformly elliptic, and the zero-order potential term involves multiplicative noise $W(ds,.)$, W need only be the spatial derivative, in the distributional sense, of a $L^2(M)$-valued white-noise, in order for the solution to exist in $L^2([0,T]\times M)$. The randomness of L and the spatial irregularity of W forces the SPDE to be interpreted as an anticipating ("forward") stochastic evolution equation in $L^2([0,T]\times M)$. Generalizations to non-multiplicative noise, and the question of Holder-continuity, are considered. A second goal is to study the almost-sure large time exponential behavior (Lyapunov exponent) of the solution in the case of a linear potential with multiplicative noise. We will look for evidence that W must then be required to be a function, not a distribution, in the space parameter. The estimation of an eventual Lyapunov exponent can then use a stochastic Feynman-Kac formula. (Received September 28, 2000)