1136-60-153 **Konstantinos Spiliopoulos*** (kspiliop@math.bu.edu), Boston University, Department of Mathematics and Statistics, Boston, MA 02215. *Large deviations and averaging for systems of slow–fast stochastic reaction–diffusion equations.* Preliminary report.

We study a large deviation principle for a system of stochastic reaction-diffusion equations (SRDEs) with a separation of fast and slow components and small noise in the slow component. The derivation of the large deviation principle is based on the weak convergence method in infinite dimensions, which results in studying averaging for controlled SRDEs. By appropriate choice of the parameters, the fast process and the associated control that arises from the weak convergence method decouple from each other. We characterize the limiting process via a "viable pair" that captures the limiting controlled dynamics and the effective invariant measure simultaneously. The characterization of the limit of the controlled slow-fast processes in terms of viable pair enables us to obtain a variational representation of the large deviation action functional. Due to the infinite–dimensional nature of our set–up, the proof of tightness as well as the analysis of the limit process and in particular the proof of the large deviations lower bound is considerably more delicate here than in the finite–dimensional situation. We emphasize that many issues that are present in the infinite dimensional case, are completely absent in finite dimensions. Joint work with Wenqing Hu and Michael Salins. (Received January 10, 2018)