1135-60-1074   **Quan Yuan*** (`qyuan@bsu.edu`), Department of Mathemtical Science, Ball State University, Muncie, IN 47306, and **George Yin** (`gyin@wayne.edu`), Department of Mathematics, Detroit, MI 48202. *Infinite dimensional regime-switching stochastic approximation algorithms.*

We analyze a type of stochastic approximation algorithms with regime switching modulated by a discrete Markov chain having countable state spaces and two-time-timescale construction. In the algorithm, the increments of a sequence of occupation measures are updated using constant step size iterates. We show that least squares estimates of the tracking errors can be developed. Under the assumption that the adaptation rates have the same magnitude as that of times-different parameter, we prove the continuous-time interpolation from the iterates converges weakly to a system of ordinary differential equations with regime switching. In addition, we demonstrate that the suitably scaled sequence of the tracking errors converges to a system of switching diffusions. (Received September 19, 2017)