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**Hakima Bessaih\*** (bessaih@uwyo.edu), 1000 E. University Ave, Dept. 3036, Laramie, WY 82071, and **Yalchin Efendiev** and **Florin Maris**. *Homogenization of the evolution Stokes equation in a perforated domain with a stochastic Fourier boundary condition.*

The evolution Stokes equation in a perforated domain subject to Fourier boundary condition on the boundaries of the holes is considered. We assume that the dynamic is driven by a stochastic perturbation on the interior of the domain and another stochastic perturbation on the boundaries of the holes. The macroscopic (homogenized) equation is derived as another stochastic partial differential equation, defined in the whole non perforated domain. Here, the initial stochastic perturbation on the boundary becomes part of the homogenized equation as another stochastic force. We use the two-scale convergence method after extending the solution with 0 in the wholes to pass to the limit. Due to the particular boundary condition dealt with, we get that the solution of the stochastic homogenized equation is not divergence free. However, it is coupled with the cell problem that has a divergence free solution. (Received September 14, 2014)