1119-60-49 **Hakima Bessaih*** (bessaih@uwyo.edu), Department of Mathematics, Dept. 3036, 1000 East University Avenue, Laramie, WY 82071, and **Yalchin Efendiev** and **Florian Maris**.

Homogenization of Brinkman flows in heterogeneous dynamic media.

We study Brinkman's equations with microscale properties that are highly heterogeneous in space and time. The time variations are controlled by a stochastic particle dynamics described by an SDE. The particle dynamics can be thought as particle deposition that often occurs in filter problems. Our main results include the derivation of macroscale equations and showing that the macroscale equations are deterministic. The latter is important for our (also many other) applications as it greatly simplifies the macroscale equations. We use the asymptotic properties of the SDE and the periodicity of the Brinkman's coefficient in the space variable to prove the convergence result. The SDE has a unique invariant measure that is ergodic and strongly mixing. The macro scale equations are derived through an averaging principle of the slow motion (fluid velocity) with respect to the fast motion (particle dynamics) and also by averaging the Brinkman's coefficient with respect to the space variable. Our results can be extended to more general nonlinear diffusion equations with heterogeneous coefficients. (Received February 02, 2016)