1139-35-618 **Juraj Foldes*** (foldes@virginia.edu), **Nathan Glatt-Holtz**, **Geordie Richards** and **Jared Whitehead**. *Stochastic variational problems and applications to fluid dynamics.*

Stochastic Boussinesq system is a model for buoyancy driven convection with random exterior fluctuations. As in the deterministic systems, also in random setting it is important to understand equilibria and their stability properties. In particular if there is just one statistical equilibrium, it is asymptotically stable and globally attractive, and therefore the existence of multiple steady states is closely connected to their stability. In turn, stability of statistical equilibria lead to constraint variational problems with random potentials, and consequently to random eigenvalue problems. We will rigorously analyze minimizers of random functionals and show that the small stochastic forcing stabilizes the system, compared to the deterministic one, and large stochastic forcing destabilizes Boussinesq system. (Received February 20, 2018)