1125-60-1153 **Shannon Starr*** (slstarr@uab.edu) and **Meg Walters**. *Phase Uniqueness for the Mallows Model.*

The Mallows model on permutations on $\{1, ..., n\}$ is a probability wherein $P(\pi)$ is proportional to q-raised-to-the-power $I(\pi)$, where $q > 0$ is the parameter of the model, and $I(\pi)$ is the number of pairs $i < j$ such that $\pi(i) > \pi(j)$. This model was considered by Bhatnagar and Peled, and culminating with Basu and Bhatnagar a regenerative process was discovered in the background, especially useful for describing the limit where $0 < q < 1$ stays fixed and n goes to infinity so $\{1, \dots, n\} \to \{1, 2, ...\}$. In another scaling regime, $q = q_n = \exp(-\beta/n)$, Sumit Mukherjee proved a LDP and identified the explicit rate function for the limiting permuton. This may be viewed as a Gibbsian field for a mean field system. We prove that for the Gibbsian system, there is a unique equilibrium state, aka "phase uniqueness." Our proof uses the cavity step, which in this case is just the dynamic programming principle, which is related to the regenerative structure of Bhatnagar, et al. (Received September 18, 2016)