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Juraj Foldes* (foldes@virginia.edu) and **Mouhamadou Sy**. *Invariant measures for SQG equation.*

Using a fluctuation dissipation method, we construct an invariant measure for the surface quasi-geostrophic equation (SQG). We also show that the measure is not supported on any finite dimensional manifold. Since the support of the measure contains entire solutions, we obtain an infinite dimensional manifold containing solutions that do not blow-up. This complements results in which a blow-up solutions for SQG are constructed. The method of the proof relies on an addition of a stochastic forcing and a small dissipation to the equation. For such stochastic equation, one can construct an invariant measure and by passing the strength of the forcing and the dissipation to zero, we obtain the desired invariant measure. The estimates on the support of the invariant measure rely on the fact that SQG has infinitely many conservation laws. This is a joint project with Mouhamadou Sy. (Received August 31, 2018)