1100-35-221 **Juraj Foldes*** (foldes@ima.umn.edu), Institute for Mathematics and its Application, University of Minnesota, 207 Church Street SE, Minneapolis, MN 55455, and **Vladimir Sverak** (sverak@math.umn.edu), School of Mathematics, University of Minnesota, 206 Church Street SE, Minneapolis, MN 55455. *Symmetry properties of maximal entropy solutions for 2D Euler's equation.*

Two dimensional turbulent flows for large Reynold's numbers can be approximated by solutions of incompressible Euler's equation. As time increases, the solutions of Euler's equation are increasing their disorder; however, at the same time, they are limited by the existence of infinitely many invariants. Hence, it is natural to assume that the limit profiles are functions which maximize an entropy given the values of conserved quantities. Such solutions are described by methods of Statistical Mechanics and are called maximal entropy solutions. Nevertheless, there is no general agreement in the literature on what is the right notion of the entropy. We will show that on the two dimensional torus, independently of the choice of entropy, the maximal entropy solutions with small energy depend only on one variable. This agrees with numerical experiments where one can observe characteristic bar states. We will also discuss the shapes of the entropy solutions on other symmetric domains. (Received February 08, 2014)