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Eventual Regularity of the Solutions to the Supercritical Dissipative Quasi-Geostrophic Equation.

Recently, Silvestre proved that certain weak solutions of the slightly supercritical surface quasi-geostrophic equation eventually become smooth. To prove this, he employed a De Giorgi type argument originated in the work of Caffarelli and Vasseur. Kiselev and Nazarov proved a variation of the result of Caffarelli and Vasseur by introducing a class of test functions. Motivated by the results of Silvestre, we will modify the class of test functions from the work of Kiselev and Nazarov and use this modified class to show that a solution to the supercritical SQG that is smooth up to a certain time must remain smooth forever. (Received September 22, 2010)