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Alexander Kiselev, Yao Yao and Andrej Zlatos* (zlatos@ucsd.edu). *Local regularity for the modified SQG patch equation.*

We show local regularity for the patch dynamics version of the modified SQG equation, which interpolates between the two-dimensional Euler and SQG equations as a parameter α increases from 0 to $\frac{1}{2}$. The result holds for all $\alpha < \frac{1}{2}$ for the PDE on the whole plane, and for all small enough α on the half-plane. The latter case is a precursor to our proof of finite time blow-up for this model, while the question of global regularity remains open on the whole plane. (Received September 26, 2017)