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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  $\alpha$  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  $\alpha$  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 12, 2017)