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Dhanapati Adhikari* (dadhikari@marywood.edu), 2300 Adams Avenue, Marywood University, Scranton, PA 18509. *Global regularity results for the 2D Boussinesq equations with partial dissipation.*

The two-dimensional (2D) incompressible Boussinesq equations model geophysical fluids and play an important role in the study of the Raleigh-Bernard convection. Mathematically this 2D system retains some key features of the 3D Navier-Stokes and Euler equations such as the vortex stretching mechanism. The issue of whether the 2D Boussinesq equations always possess global (in time) classical solutions can be difficult when there is only partial dissipation or no dissipation at all. This paper obtains the global regularity for two partial dissipation cases and proves several global *a priori* bounds for two other prominent partial dissipation cases. These results take us one step close to a complete resolution of the global regularity issue for all the partial dissipation cases involving the 2D Boussinesq equations. This is a joint work with C. Cao, H. Shang, J. Wu, X. Xu, and Z. Ye. (Received September 22, 2015)