1054-76-57 **Andrea Bertozzi*** (`bertozzi@math.ucla.edu`), 520 Portola Plaza, UCLA Department of Mathematics, Los Angeles, CA 90095, and **Thomas Laurent** (`laurent@math.ucla.edu`), 520 Portola Plaza, UCLA Department of Mathematics, Los Angeles, CA 90095. *Well-posedness of a multidimensional aggregation equation.*

We consider the 'active scalar' aggregation equation defined by the motion of a density by a vector field defined by the gradient of a scalar potential convolved with the density, $u_t - \nabla \cdot (u \nabla K * u) = 0$. When the potential is attractive this process results in aggregation of the density. We present new results on local and global well-posedness for this problem for bounded data, data in the L^p spaces, and for very weak measure solutions. Some of the results connect to classical well-posedness results for the inviscid Euler equations from fluid dynamics. The main difference is that the problem considered involves a gradient vector field rather than one that is divergence free. Some of the work is joint with Jose Carillo and Jesus Rosado from Barcelona. (Received August 31, 2009)

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