By a classical result of Codazzi every closed, totally umbilic surface is a round sphere. De Lellis and Mller proved a rigidity statement corresponding to this result. More precisely, they showed that for every closed surface in R^3, whose traceless second fundamental form is "small" in L^2, there exists a conformal parametrization whose distance to a standard parametrization of a round sphere is small in $W^{2,2}$. In a recent joint work with H. Nguyen (Warwick) we were able to extend this result to arbitrary codimensions. Moreover, we obtained related rigidity results for inversions of the catenoid and Enneper‘s minimal surface. In my talk I will review the analytic preliminaries (i.e. the results of Mller-Sverak and Kuwert-Li) and I will sketch the proof of the above mentioned results.