1067-35-57 **Armin Schikorra*** (schikorra@instmath.rwth-aachen.de), Institut für Mathematik, RWTH Aachen, Templergraben 55, 52062 Aachen, NRW, Germany. *Regularity of n/2-harmonic maps into spheres.*

We prove Hoelder continuity for $n/2$-harmonic maps from subsets of $\mathbb{R}^n$ into a sphere. This extends a recent one-dimensional result by F. Da Lio and T. Riviere to arbitrary dimensions. The proof relies on compensation effects which we quantify adapting an approach for Wente's inequality by L. Tartar, instead of Besov-space arguments which were used in the one-dimensional case. Moreover, fractional analogues of Hodge decomposition and higher order Poincare inequalities as well as several localization effects for nonlocal operators similar to the fractional laplacian are developed and applied. (Received July 02, 2010)