1030-41-240   **W. R. Madych*** (`madych@math.uconn.edu`), Dept. of Math., Univ. of Connecticut, Storrs, CT 06269-3009. *Harmonic Polysplines.* Preliminary report.

Polysplines, so christened and subsequently promoted by Ognyan Kounchev, are natural multivariate analogues of classical univariate piecewise polynomial splines. In the case of n variables the discrete set of knots of the classical scenario is replaced by an appropriate collection of $n-1$ dimensional manifolds. In this work we establish properties of harmonic polysplines that interpolate arbitrary distributions defined on parallel hyperplanes. Among other things we show that (a) such polysplines provide a solution to the natural minimization problem involving the class of distributions whose gradient is square integrable and (b) in the case when the data are polynomials such polysplines coincide with harmonic polynomials on the slabs which are determined by the parallel hyperplanes. (Received August 03, 2007)