

# CONVERGENCE OF INCREASINGLY FLAT RADIAL BASIS INTERPOLANTS TO POLYNOMIAL INTERPOLANTS

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## ABSTRACT

In this paper, we study the convergence behavior of interpolants by smooth radial basis functions to polynomial interpolants in  $\mathbb{R}^d$ , as the radial basis functions are scaled to be increasingly flat. Larson and Fornberg [1] conjectured a sufficient property for this convergence, and they also conjectured that Bessel radial functions do not satisfy this property. First, in the case of positive definite radial functions, we prove both conjectures by Larsson and Fornberg for the convergence of increasingly flat radial function interpolants. Next, we extend the results to the case of conditionally positive definite radial functions of order  $m > 0$ .

**AMS (MOS) Subject Classification.** 41A05, 41A15, 41A25, 41A30, 41A63

**Keywords:** Radial basis function, Interpolation, Polynomial, Conditionally Positive Definite Function.

## REFERENCES

1. E. Larsson, B. Fornberg, *Theoretical and computational aspects of multivariate interpolation with increasingly flat radial basis functions*, *Comp. Math. Appl.* 49 (2005) 103-130.
2. R. Schaback, *Multivariate Interpolation by Polynomials and Radial Basis Functions*, *Constr. Approx.* 21, p. 293-317, 2005