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Harry Gingold* (gingold@math.wvu.edu), West Virginia University, Department of Mathematics, Morgantown, WV 26505. *THE PARABOLIC COMPACTIFICATION AND APPLICATIONS TO DYNAMICAL SYSTEMS.*

The properties of a compactification that maps the n dimensional Euclidean space onto a "parabolic bowl" are studied. Unlike the stereographic projection this compactification distinguishes among the different directions "at infinity". This compactification represents the n dimensional Euclidean space in terms of rational functions. A new invariant set for solutions of dynamical systems emerges.

A partial list of the applications of the parabolic compactification include the following. The rational approximation of unbounded functions. The approximation of unbounded periodic functions by quotients of trigonometric polynomials. The identification of critical points at infinity of polynomial dynamical systems. The representation of solutions of polynomial dynamical systems and their rate of blow up. The global nature of solutions to the Lorenz equations away from the attractor set. (Received January 28, 2009)