1014-34-1267 **Peter W Bates** (bates@math.msu.edu), Department of Mathematics, D207 Wells Hall, Michigan State University, East Lansing, MI 48824, and **Chunlei Zhang*** (zhangch2@msu.edu), Department of Mathematics, Michigan State University, East Lansing, MI 48824. *Traveling Pulses for the Klein-Gordon Equation on a Lattice or Continuum with Long-range Interaction.*

We study traveling pulses on a lattice and in a continuum where all pairs of particles interact, contributing to the potential energy. The interaction may be positive or negative, depending on the particular pair but overall is positive in a certain sense. For such an interaction kernel J with unit integral (or sum), the operator $\frac{1}{\varepsilon^2}[J * u - u]$, with $*$ continuous or discrete convolution, shares some common features with the second derivative operator in space, especially when ε is small, and so the equation $u_{tt} - \frac{1}{\varepsilon^2}[J * u - u] + f(u) = 0$ may be compared with the nonlinear Klein Gordon equation $u_{tt} - u_{xx} + f(u) = 0$. If f is such that the Klein-Gordon equation has supersonic traveling pulses, we examine whether the same is true of the nonlocal version, for both the continuum and lattice versions. (Received September 27, 2005)