Walter Carlip and Martina Mincheva
Component growth of iteration graphs under the squaring map modulo p^k,
Fibonacci Quart. **45** (2007), no. 3, 239–246.

Abstract

We derive a formula for the number of components of the iteration graph $G(p^k)$ of the squaring function on the ring $\mathbf{Z}/p^k\mathbf{Z}$. In particular, if p is not a Wieferich prime, then the number of components is linear in k, and if p is a Wieferich prime, then the number of components is eventually linear in k.