

1146-35-166

**Milena Stanislavova\*** (stanis@ku.edu) and **Satbir Malhi**. *On the energy decay rates for the 1D damped fractional Klein-Gordon equation.*

We consider the fractional Klein-Gordon equation in one spatial dimension, subjected to a damping coefficient, which is non-trivial and periodic, or more generally strictly positive on a periodic set. We show that the energy of the solution decays at the polynomial rate  $O(t^{-\frac{s}{4-2s}})$  for  $0 < s < 2$  and at some exponential rate when  $s \geq 2$ . Our approach is based on the asymptotic theory of  $C_0$  semigroups in which one can relate the decay rate of the energy in terms of the resolvent growth of the semigroup generator. The main technical result is a new observability estimate for the fractional Laplacian, which may be of independent interest. (Received January 19, 2019)