Modes of infinitely long strings

- A finite string with “standard” boundary conditions supports resonances (certain standing waves)
- Sturm Liouville problem (continuous eigenvalue problem)
  - Find resonance modes and frequencies
  - Use them to describe “any” function
  - Eigenfunctions are orthogonal
- An infinite string with variable density also has modes
  - Complex eigenvalues (decay)
  - Eigenfunctions no longer orthogonal is a standard inner product
  - Can we use resonances to describe responses of the system?
Primary Goals:
- study the problem of the infinite string
- Implement a numerical solver that describes oscillations of an infinite string in terms of open resonances

Secondary directions:
• Infinite membranes?
• Kac 1966: Can you hear the shape of a drum?