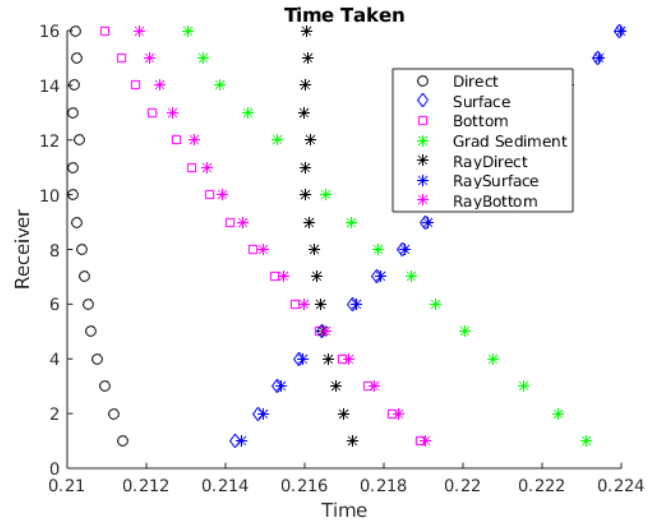


Project Description (Math 707)

Parallel computing for CDF receiver locations along a path in shallow water inversion¹

There are 16 receivers placed in shallow water at a depth z_r and across a distance R there is a source in depth z_s that emits a sound. Ray theory approximates the travel time and travel path of the source being emitted and tracks its back to the receiver through the natural path given the constraints. A CDF is implemented into the location of each of the z_r for the different path taken. Once the ray travel times are computed, we can solve the inverse problem of estimating geoacoustic properties of the sediment, source location coordinates, water column sound speed, and ocean depth: the computed travel times for assumed environments will be compared using a similarity metric to arrival times extracted from real data. It is computationally burdensome to estimate these latter arrival times. This will be achieved with a number of particle filters (sequential Bayesian filters) or Gibbs samplers, which we will parallelize.



¹ Project arises from my research