

A 2-D Random Walk is propagated in a 2-D (x-y) plane using a random angle in  $[0, 2\pi]$  (generated by a pseudo-random number generator) in each step such that step length in x-direction as  $\cos(\text{angle})$  and in the y-direction as  $\sin(\text{angle})$ , so the odds of going in any direction is equally probable. We simulated the random walk 100 times for 5 different step sizes of 250, 500, 750, 1000, and 1500 starting from the origin.

We can also notice the average of the final coordinates from 100 different simulations is closer to zero for all step sizes. And the radial distance increased on an average with increasing step size.

We can also see that the plot obtained for R.M.S vs  $\sqrt{n}$  is almost a straight line with the slope being a bit closer to 1, which would be in agreement with theory if we were averaging the values for an infinite number of simulations.