

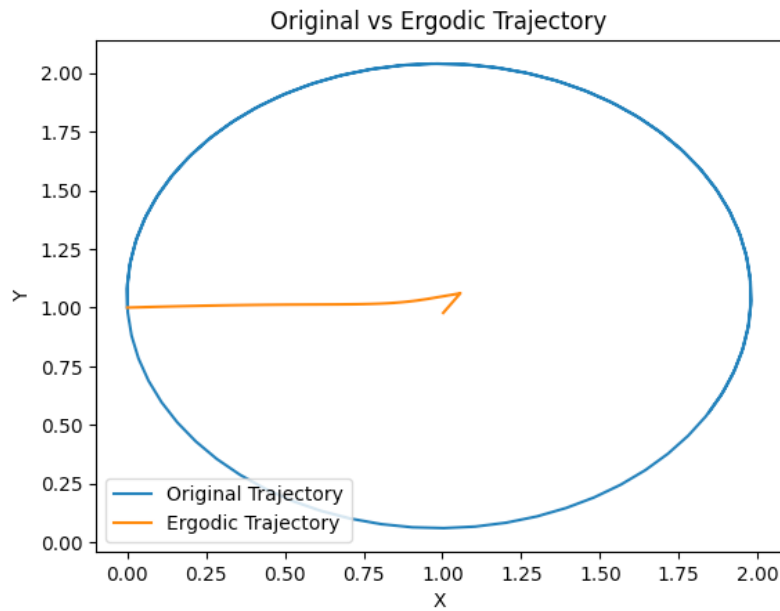
## ME 455 Homework 5

### Ian Shi

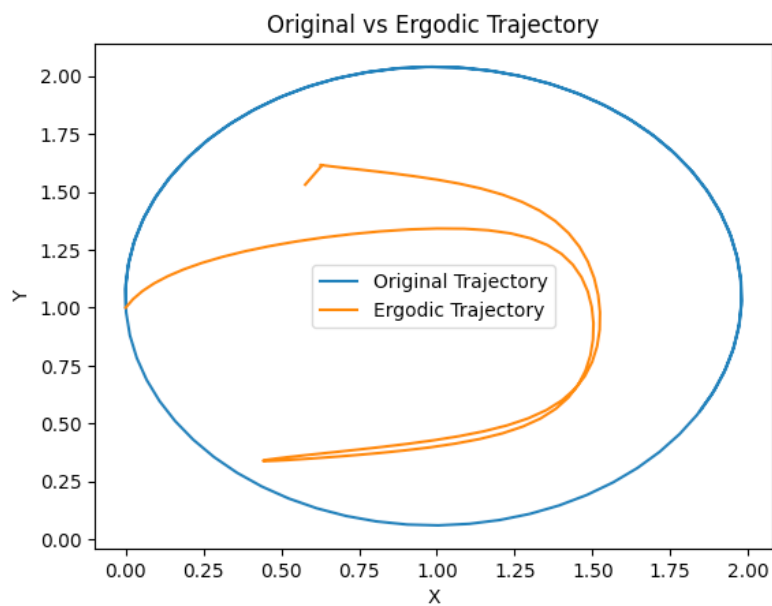
#### Problem 1

For the maximally ergodic trajectory calculation, a series of different values of  $q$ ,  $Q$ , and  $R$  were used (shown in the different graphs). For all cases,  $P1 = [0, 0]$ ,  $K=10$ , and the initial trajectory was assumed to be a circle centered around  $[1, 1]$ .

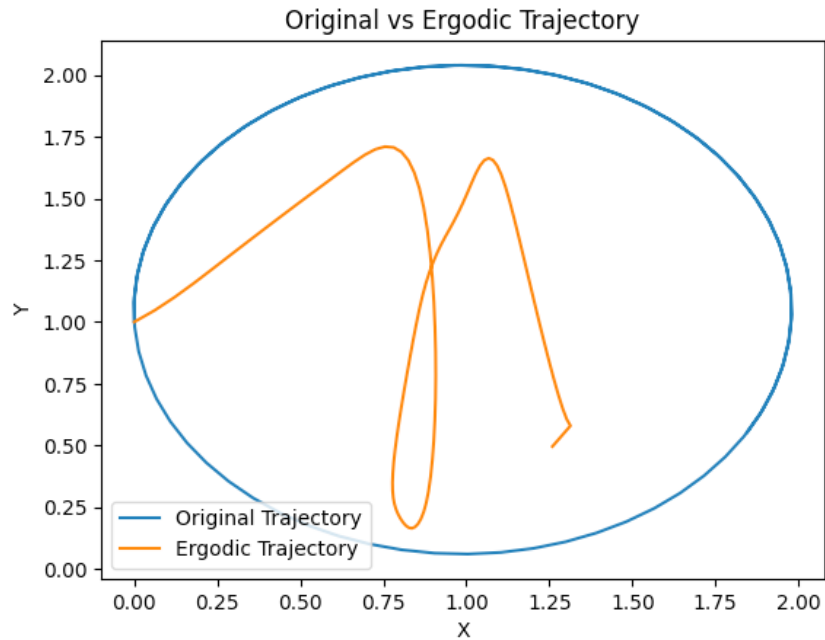
Case 1:  $q = 1$ ,  $Q = I$ ,  $R = I$



Case 2:  $q = 100$ ,  $Q = I$ ,  $R = I$



Case 3:  $q = 10$ ,  $Q = I$ ,  $R = [1, 0], [0, 0.1]$



Below also shows DJ decreasing with each iteration:

```
DJ = 2.005553802695221
DJ = 1.8324871172674015
DJ = 1.6750732914126583
DJ = 1.5319110576084862
DJ = 1.4013989944765939
DJ = 1.2820339535799017
DJ = 1.1724604381848278
DJ = 1.0715698266447382
DJ = 0.9785146654970349
DJ = 0.892602792721538
DJ = 0.8132100639316286
DJ = 0.7397810029740397
DJ = 0.6718578827541068
DJ = 0.609068999559411
DJ = 0.5510736706584313
DJ = 0.4975144639166138
DJ = 0.44801798149793354
DJ = 0.4022375402038181
DJ = 0.3599006034105171
DJ = 0.3208281864513227
DJ = 0.2849143863690149
DJ = 0.25207701436214686
DJ = 0.2220665719032315
DJ = 0.1951411554131804
DJ = 0.17067421035798425
...
DJ = 0.007912806423148167
DJ = 0.0046588988627695406
DJ = 0.0017189940786727295
DJ = 0.0009585193508559839
```