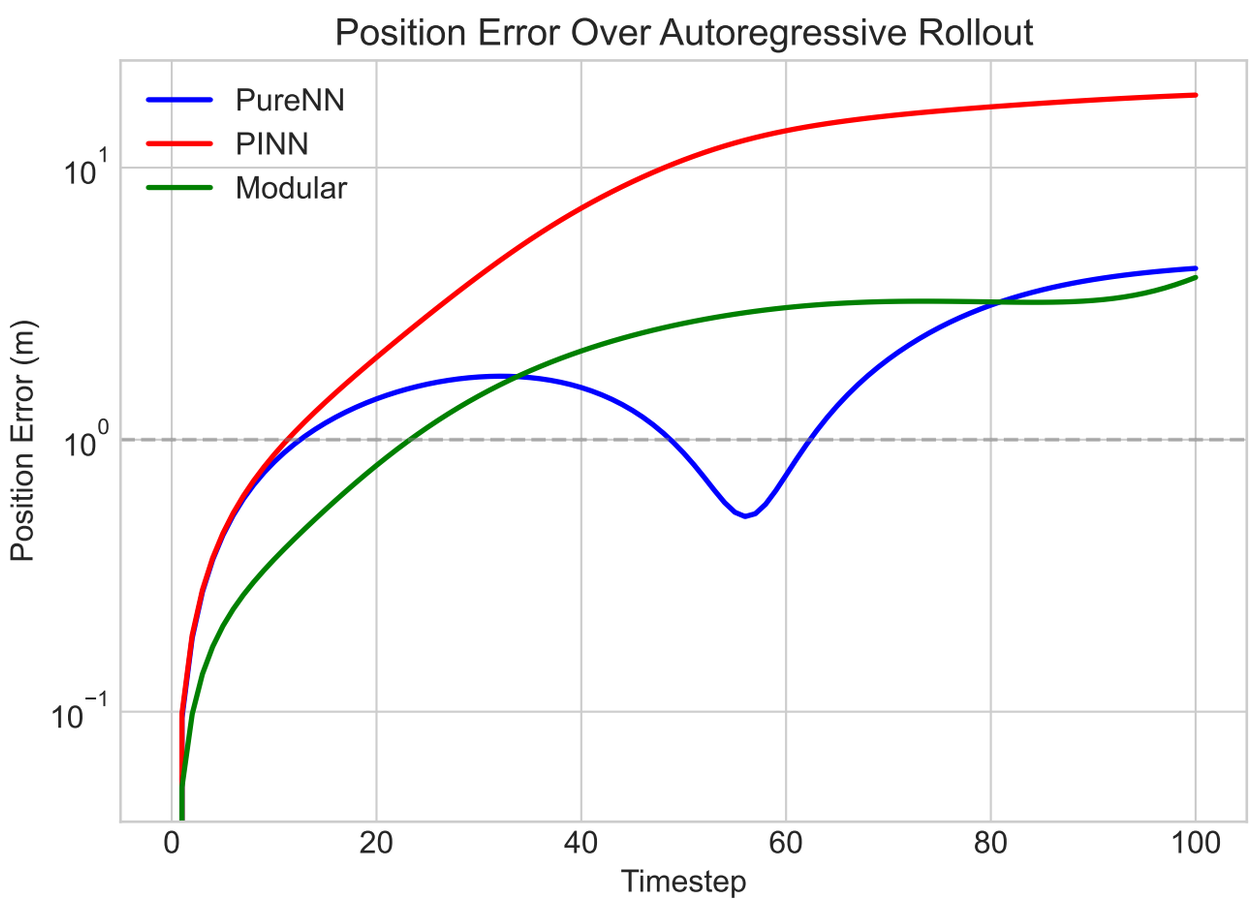
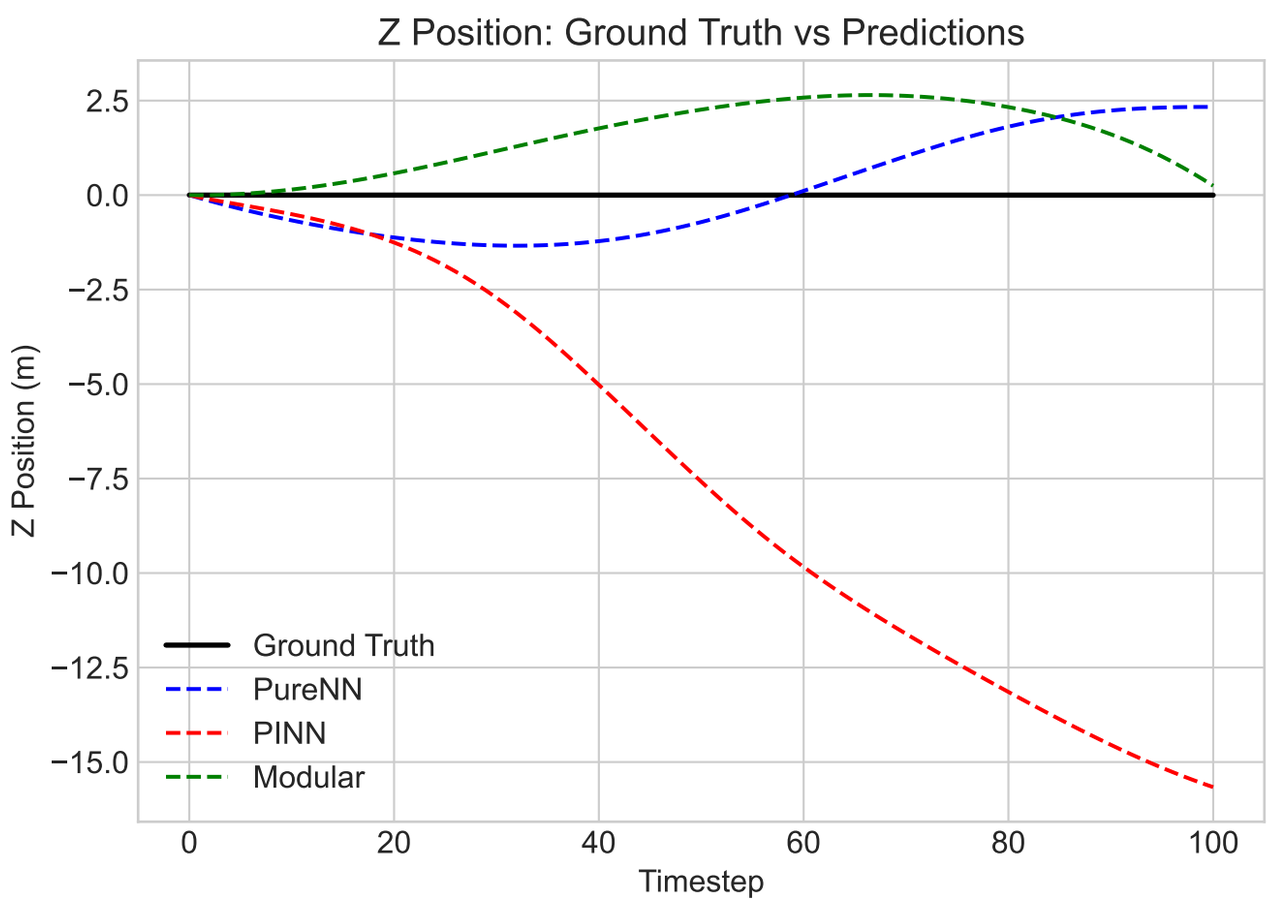
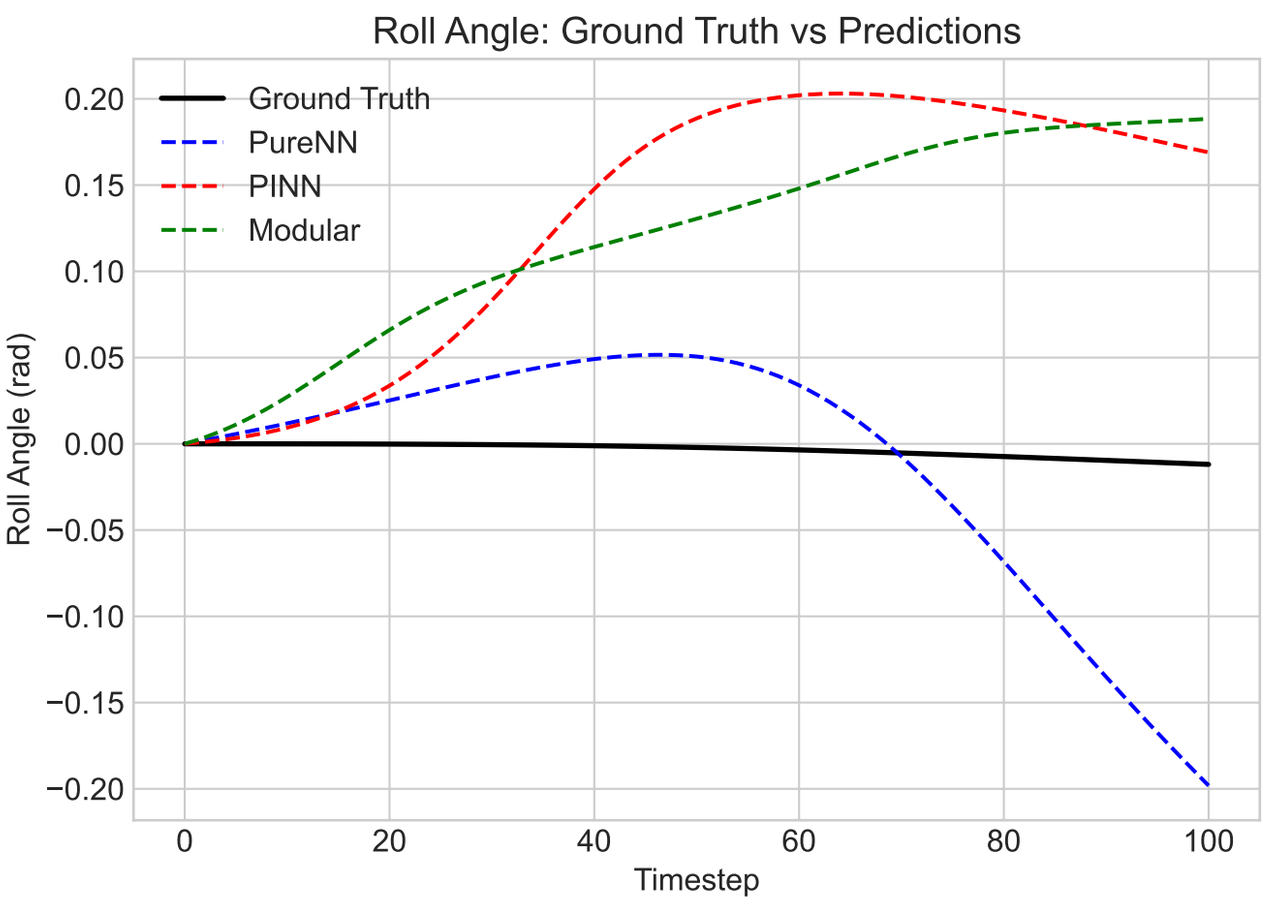
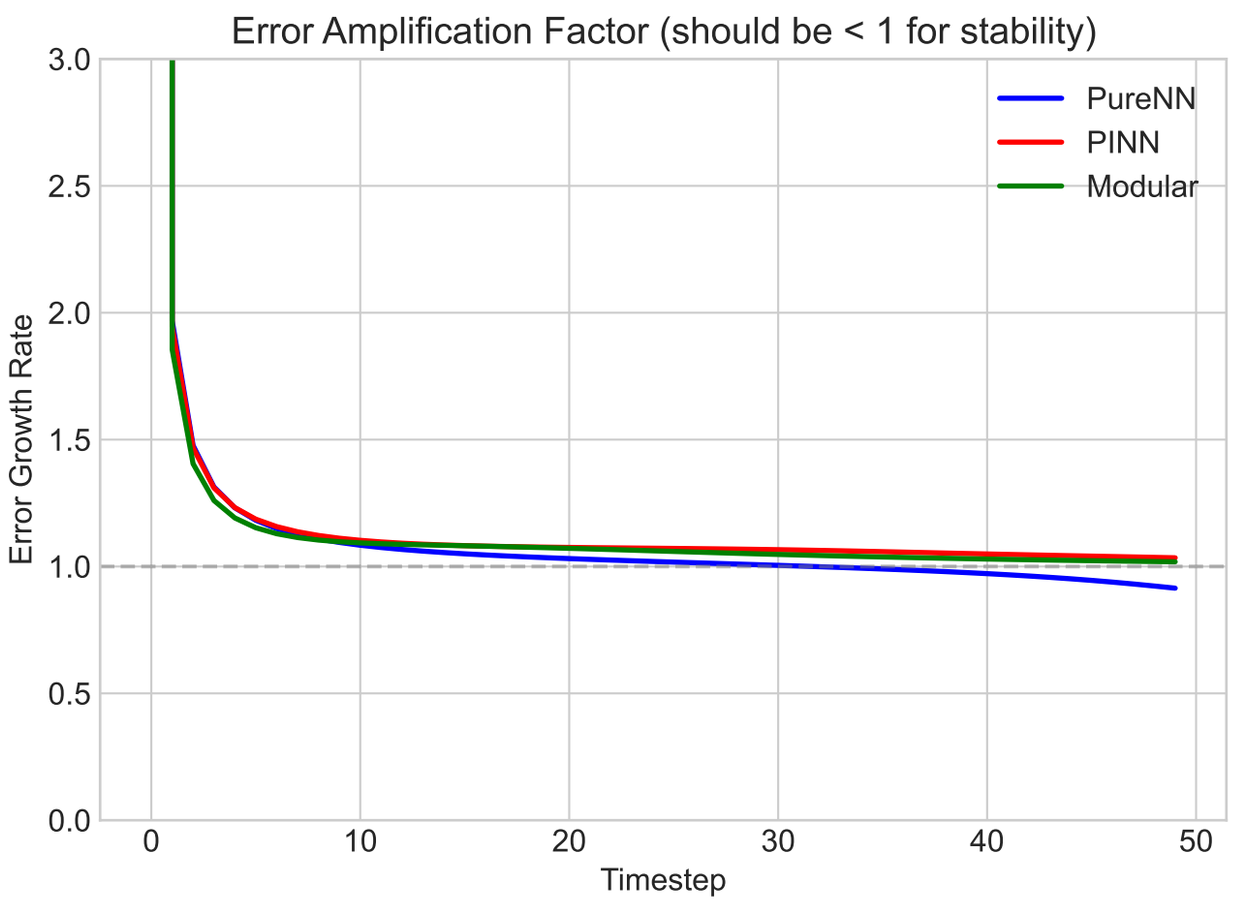

Position Error Over Autoregressive Rollout
PureNN
PINN
Modular
10^{1}
10^{0}
10^{-1}
Position Error (m)
0
20
40
60
80
100
Timestep


Z Position: Ground Truth vs Predictions
2.5
0.0
−2.5
−5.0
−7.5
−10.0
−12.5
−15.0
Z Position (m)
Ground Truth
PureNN
PINN
Modular
0
20
40
60
80
100
Timestep


Roll Angle: Ground Truth vs Predictions
0.20
0.15
0.10
0.05
0.00
−0.05
−0.10
−0.15
−0.20
Roll Angle (rad)
Ground Truth
PureNN
PINN
Modular
0
20
40
60
80
100
Timestep


Error Amplification Factor (should be < 1 for stability)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Error Growth Rate
PureNN
PINN
Modular
0
10
20
30
40
50
Timestep