get mechanism plot results

```
T= readtable("FourBarAngles.csv");
all_theta2=T.theta2;
all_theta3=T.theta3;
n=size(all_theta3,1);
```

input hardcode

```
syms theta2 theta3
l2 = 1
```

```
l2 = 1
```

```
angleBAP=31
```

```
angleBAP = 31
```

```
ap=3.06
```

```
ap = 3.0600
```

```
theta_transformation=26.5
```

```
theta_transformation = 26.5000
```

calculating wrt frame of the mechanism

```
% vectors are in exponential form
o2a = l2*(exp(1i*deg2rad(theta2)));
o2p = o2a + ap*(exp(1i*(theta3-deg2rad(angleBAP))));
```

tranforming the system

```
transform=[
    cosd(theta_transformation), sind(theta_transformation);
    -sind(theta_transformation), cosd(theta_transformation)
];
in_other_coord=transform*[real(o2p); imag(o2p)];
```

Calculating for each set of values of t2 and t3:

```
all_o2p_x=zeros(n,1);
all_o2p_y=zeros(n,1);

all_other_coord_x=zeros(n,1);
all_other_coord_y=zeros(n,1);
for idx = (1:n)
    thisO2P = subs(o2p, [theta2, theta3], [all_theta2(idx), all_theta3(idx)]);
    all_o2p_x(idx) = real(thisO2P);
    all_o2p_y(idx) = imag(thisO2P);

    complex_num = subs(in_other_coord, [theta2, theta3], [all_theta2(idx), all_theta3(idx)]);
    all_other_coord_x(idx) = complex_num(1);
    all_other_coord_y(idx) = complex_num(2);
```

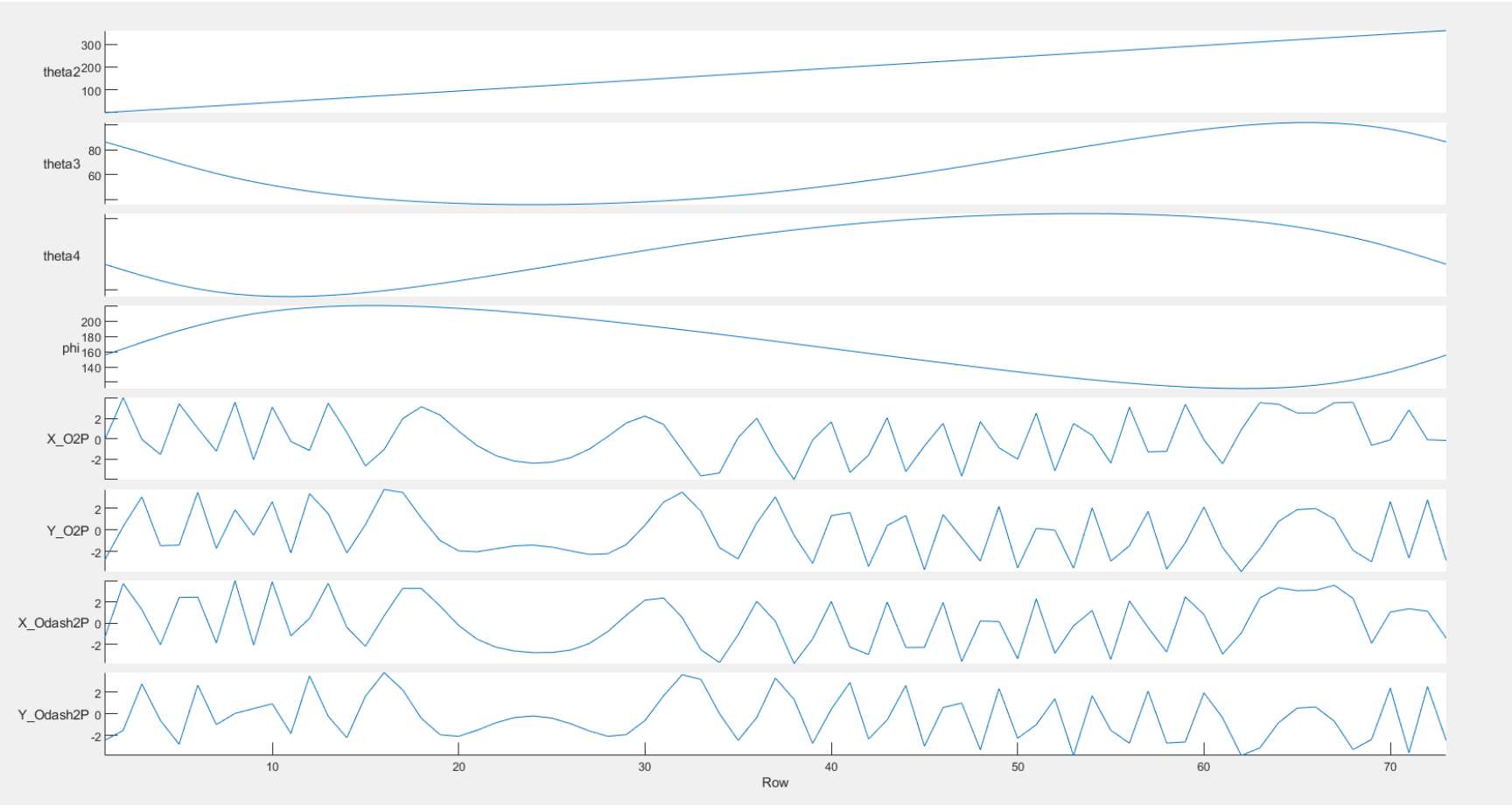
```
end
```

Store evaluated data

```
T.X_O2P=all_o2p_x;
T.Y_O2P=all_o2p_y;
T.X_Odash2P=all_other_coord_x;
T.Y_Odash2P=all_other_coord_y;
writetable(T,'FourBarAngles.csv','Delimiter',',','QuoteStrings',true);
```

theta2	theta3	theta4	phi	X_O2P	Y_O2P	X_Odash2P	Y_Odash2P
0	86.54288	118.0532	155.4039	-0.16896	-2.82792	-1.41302	-2.45541
5	82.29693	113.9997	163.7034	4.047715	0.314808	3.762906	-1.52435
10	77.86264	110.135	172.0023	-0.07184	3.045425	1.294573	2.757509
15	73.39792	106.5956	180.0064	-1.5592	-1.46957	-2.0511	-0.61946
20	69.04167	103.4884	187.47	3.440037	-1.42203	2.444101	-2.80756
25	64.90085	100.8819	194.2173	1.037391	3.479809	2.48108	2.651319
30	61.04665	98.8069	200.1464	-1.23197	-1.72756	-1.87337	-0.99635
35	57.51782	97.26258	205.2196	3.60301	1.843906	4.047204	0.04252
40	54.32765	96.22547	209.4469	-2.07621	-0.49088	-2.0771	0.487093
45	51.47179	95.6581	212.8701	3.114583	2.595932	3.945646	0.933468
50	48.93495	95.51596	215.5491	-0.2638	-2.15657	-1.19834	-1.81228
55	46.69607	95.75239	217.5515	-1.15908	3.341356	0.453609	3.507472
60	44.73184	96.32171	218.9464	3.493734	1.499395	3.795689	-0.21704
65	43.019	97.18098	219.8	0.62581	-2.14694	-0.3979	-2.2006
70	41.53563	98.29081	220.1736	-2.68183	0.470705	-2.19003	1.617876
75	40.2618	99.61559	220.1226	-1.07449	3.720177	0.698341	3.808747
80	39.17992	101.1234	219.6967	1.979007	3.455492	3.312914	2.20941
85	38.27473	102.7857	218.9395	3.145327	1.101959	3.306553	-0.41726
90	37.53326	104.5771	217.8896	2.326745	-0.98742	1.641697	-1.92187
95	36.9446	106.4747	216.5807	0.744448	-1.94864	-0.20325	-2.07607
100	36.49977	108.458	215.0423	-0.69013	-2.03129	-1.52398	-1.50994
105	36.19152	110.5083	213.3001	-1.66602	-1.75131	-2.27241	-0.82394
110	36.0141	112.6089	211.377	-2.2067	-1.48653	-2.63814	-0.34573
115	35.9631	114.7442	209.2927	-2.40855	-1.42171	-2.78986	-0.19765
120	36.03529	116.8999	207.0648	-2.31286	-1.59916	-2.7834	-0.39915
125	36.2284	119.0629	204.7087	-1.87964	-1.94812	-2.5514	-0.90475
130	36.54101	121.2206	202.2384	-1.03449	-2.26878	-1.93812	-1.56883
135	36.97237	123.3617	199.6659	0.205956	-2.2135	-0.80334	-2.07283
140	37.52223	125.4754	197.0024	1.538637	-1.37018	0.765607	-1.91276
145	38.19067	127.5516	194.2577	2.237101	0.422198	2.190443	-0.62035
150	38.97798	129.5811	191.4409	1.39818	2.558391	2.392828	1.665727
155	39.88444	131.5553	188.5602	-1.13096	3.47436	0.538113	3.613958
160	40.91019	133.4664	185.6234	-3.66571	1.732136	-2.5077	3.185781
165	42.05504	135.3073	182.6376	-3.35818	-1.64925	-3.74124	0.022437
170	43.31837	137.072	179.6097	0.109779	-2.68388	-1.0993	-2.45088
175	44.69896	138.755	176.546	2.016744	0.621759	2.082281	-0.34343
180	46.1949	140.3521	173.453	-1.3078	3.044481	0.188049	3.308146
185	47.80352	141.8596	170.3369	-4.02686	-0.50984	-3.83127	1.340503
190	49.52129	143.2749	167.2038	-0.12285	-3.10974	-1.4975	-2.7282
195	51.34386	144.5961	164.06	1.662868	1.3074	2.071517	0.428069
200	53.26601	145.8222	160.9118	-3.31499	1.587113	-2.25853	2.899504
205	55.28174	146.9526	157.7656	-1.62531	-3.39695	-2.97025	-2.31484
210	57.38424	147.9874	154.6284	2.062214	0.388266	2.018789	-0.57268
215	59.56602	148.927	151.507	-3.22656	1.31534	-2.30065	2.616825
220	61.81889	149.7721	148.409	-0.71469	-3.70236	-2.29159	-2.99447
225	64.13409	150.5234	145.3425	1.508387	1.403625	1.976201	0.583113

230	66.50227	151.1819	142.3159	-3.70256	-0.72863	-3.63866	0.999997
235	68.91352	151.748	139.3385	1.680827	-2.88827	0.215488	-3.3348
240	71.35737	152.222	136.4206	-0.89815	2.167961	0.16355	2.340937
245	73.82276	152.6039	133.5734	-2.01086	-3.52186	-3.37103	-2.25459
250	76.29795	152.8928	130.8093	2.523249	0.134473	2.318144	-1.00552
255	78.77044	153.0873	128.1423	-3.17256	-0.03119	-2.85315	1.387675
260	81.2268	153.185	125.5882	1.490823	-3.55252	-0.25094	-3.84447
265	83.6525	153.1826	123.1649	0.342149	2.033541	1.213563	1.667219
270	86.03167	153.0755	120.8928	-2.40303	-2.89448	-3.44206	-1.51815
275	88.34678	152.8578	118.7954	3.108624	-1.48027	2.121519	-2.71181
280	90.57833	152.5218	116.8999	-1.29847	1.697817	-0.40448	2.098808
285	92.70437	152.0582	115.2375	-1.24478	-3.63103	-2.73416	-2.69411
290	94.70003	151.4552	113.8448	3.389962	-1.21108	2.493411	-2.59643
295	96.53694	150.6989	112.7641	-0.11712	2.105716	0.834755	1.936734
300	98.18264	149.7725	112.0449	-2.46319	-1.62964	-2.93153	-0.35935
305	99.5999	148.6562	111.7439	0.87504	-3.86427	-0.94112	-3.84871
310	100.7462	147.3272	111.9266	3.541796	-1.74551	2.390833	-3.14246
315	101.5734	145.7597	112.667	3.390545	0.763525	3.374999	-0.82955
320	102.0277	143.9255	114.0468	2.531842	1.856324	3.09412	0.531585
325	102.0511	141.7958	116.1531	2.526082	1.966107	3.13795	0.632404
330	101.5833	139.3436	119.0731	3.534659	0.997328	3.608294	-0.68461
335	100.5671	136.5481	122.8848	3.584453	-1.90287	2.358795	-3.30232
340	98.95504	133.4017	127.6432	-0.64976	-2.95683	-1.90083	-2.35625
345	96.72017	129.9179	133.3619	-0.11358	2.604443	1.060451	2.381484
350	93.86748	126.1399	139.9926	2.83533	-2.61069	1.372551	-3.60151
355	90.44404	122.1468	147.4092	-0.10348	2.768419	1.14265	2.523728
360	86.54288	118.0532	155.4039	-0.16896	-2.82792	-1.41302	-2.45541


theta2
300
200
100
theta3
80
60
theta4
phi
200
180
160
140
X_O2P
2
0
-2
Y_O2P
2
0
-2
X_Odash2P
2
0
-2
Y_Odash2P
2
0
-2
10
20
30
40
50
60
70
Row