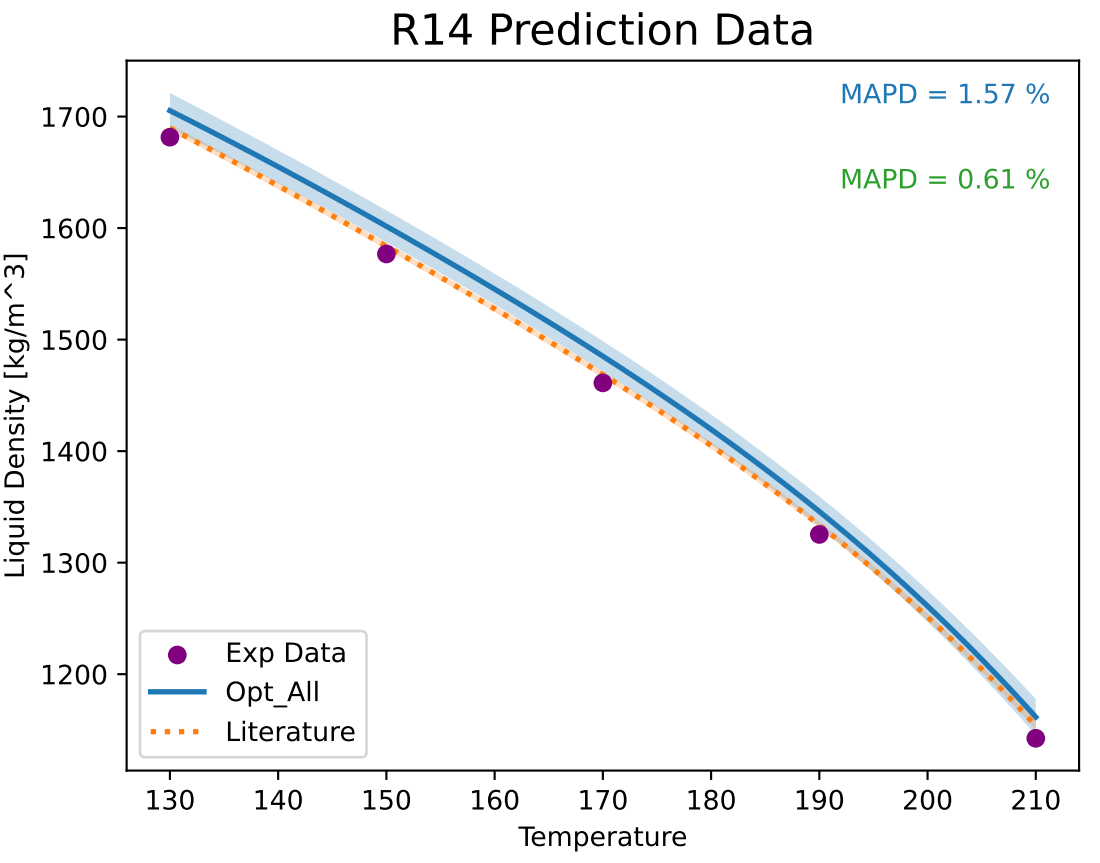
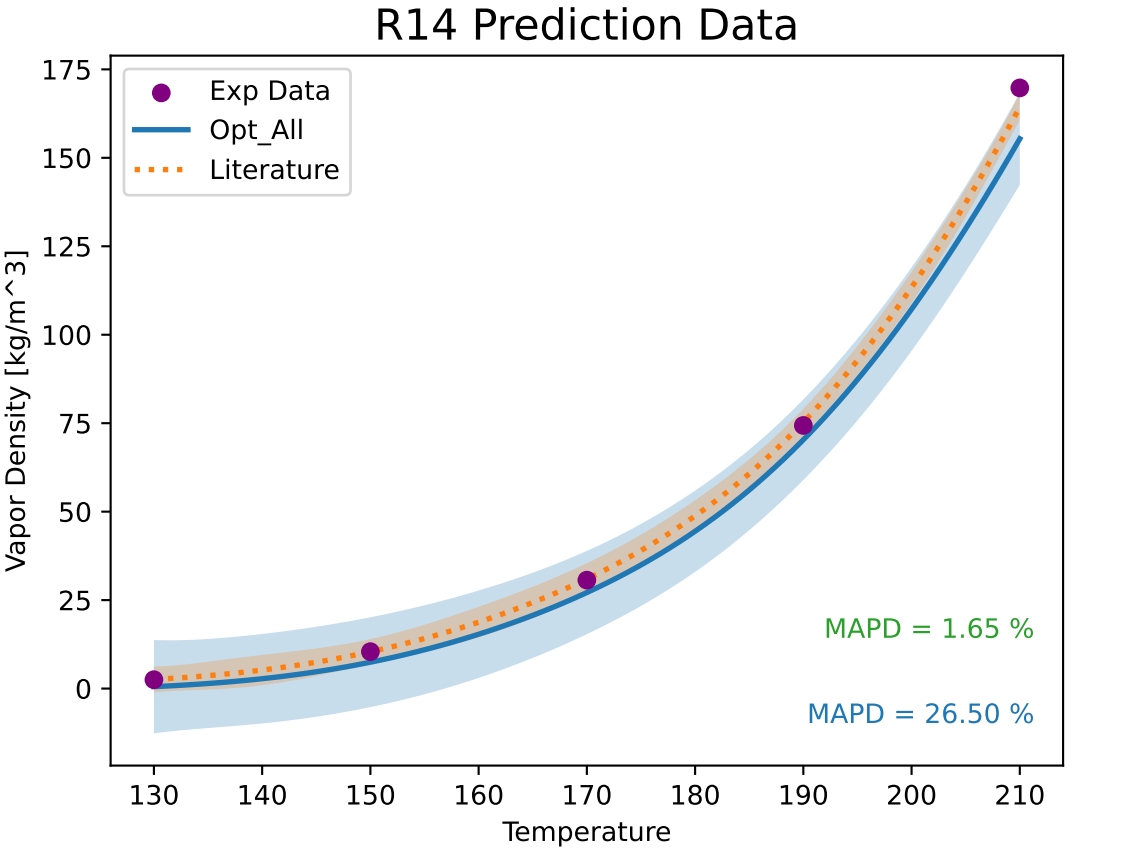
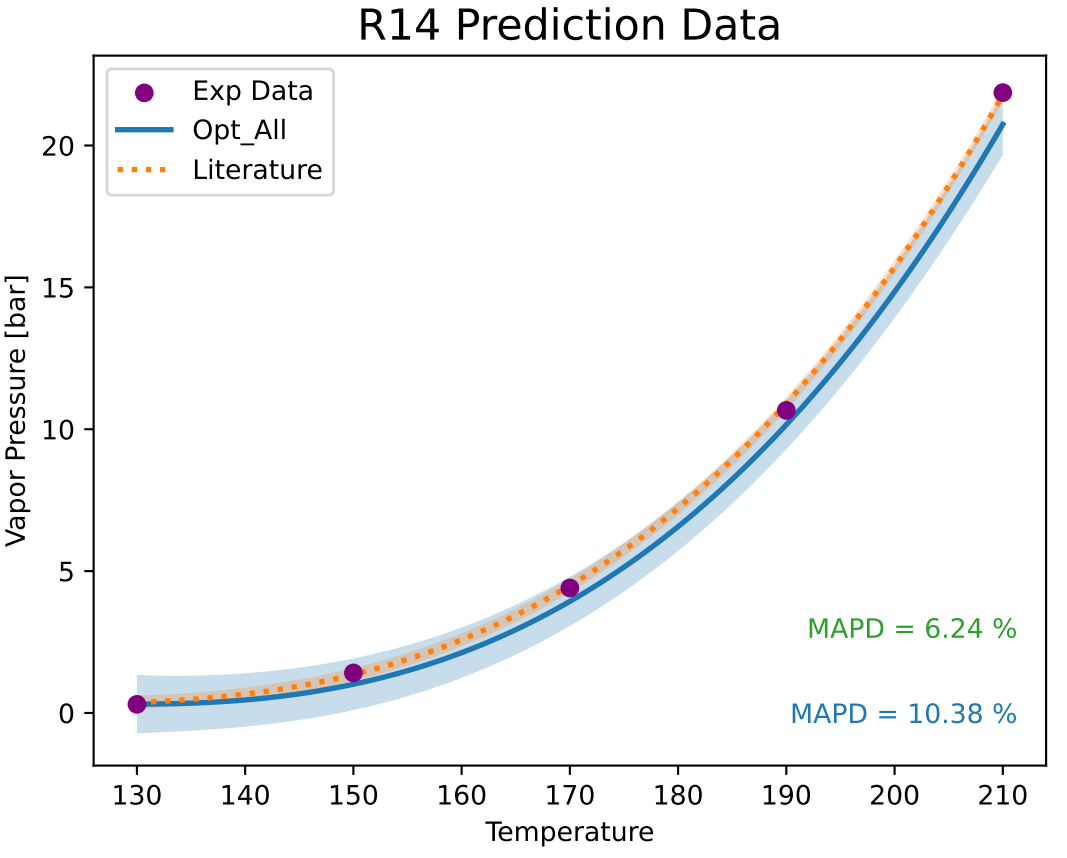
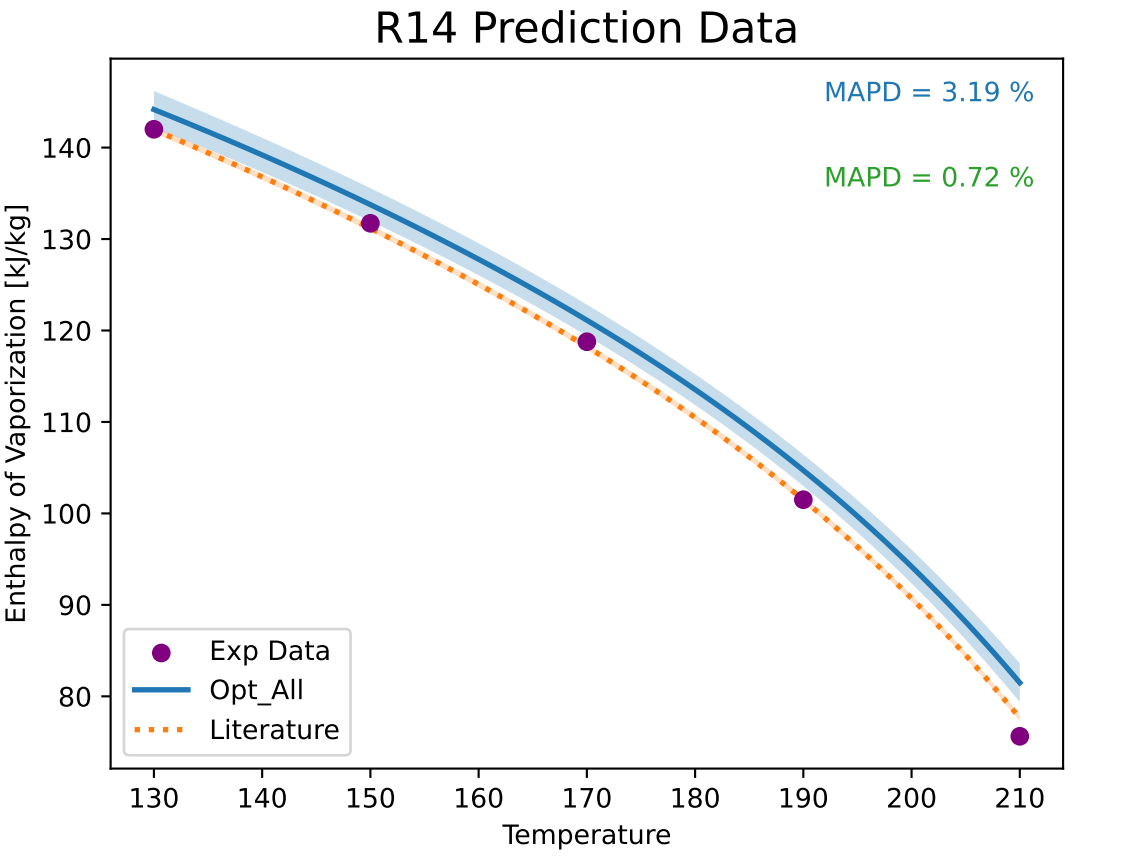
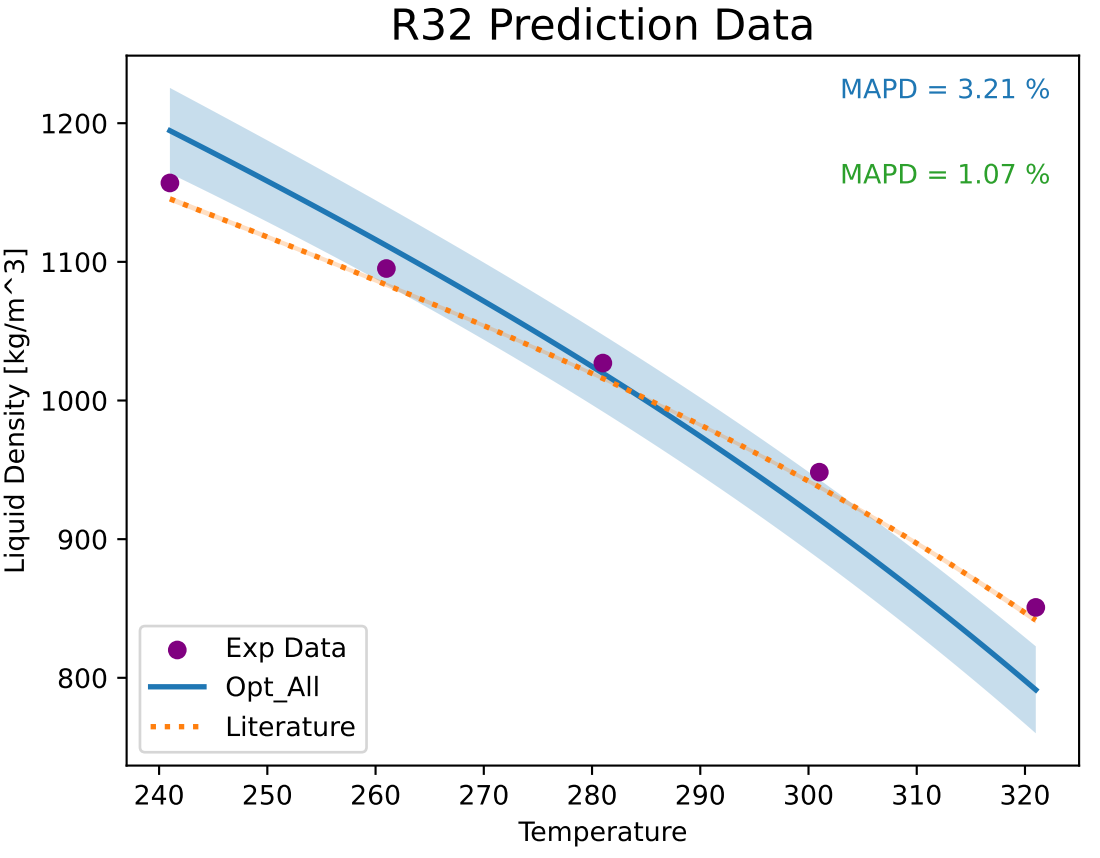
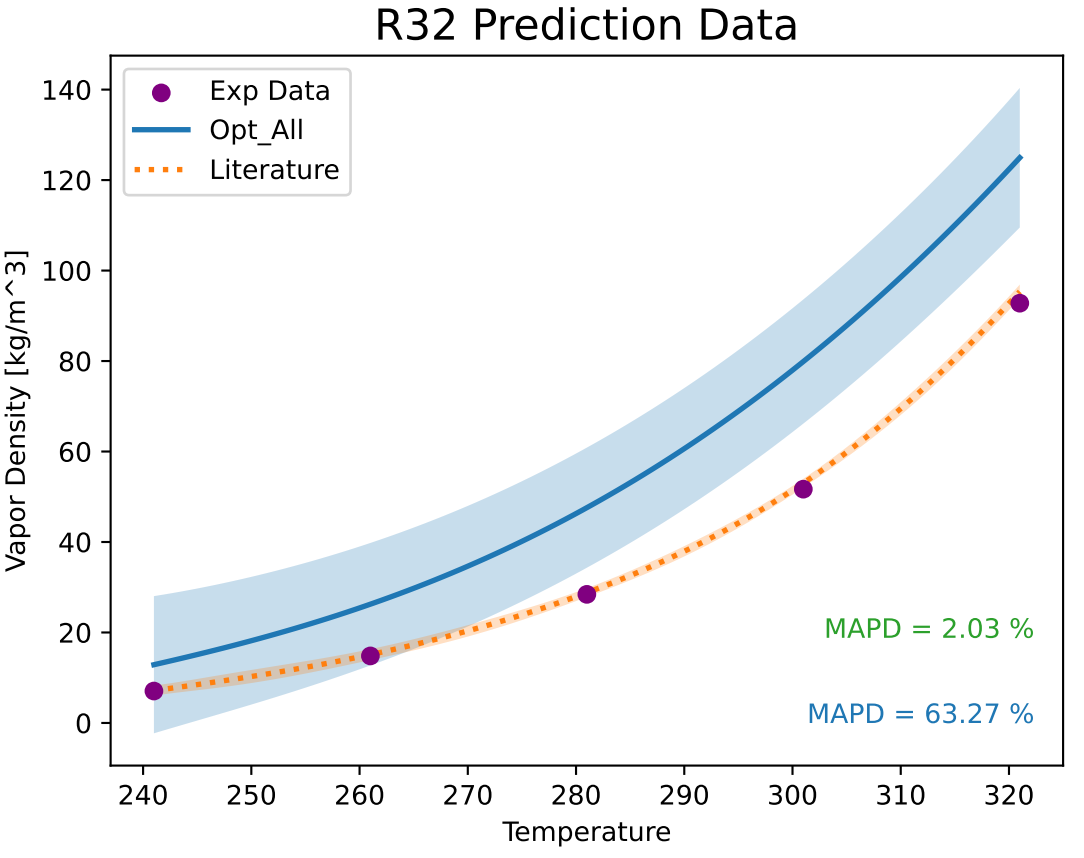

R14 Prediction Data
MAPD = 1.57 %
MAPD = 0.61 %
Exp Data
Opt_All
Literature
Liquid Density [kg/m^3]
Temperature
1700
1600
1500
1400
1300
1200
130
140
150
160
170
180
190
200
210

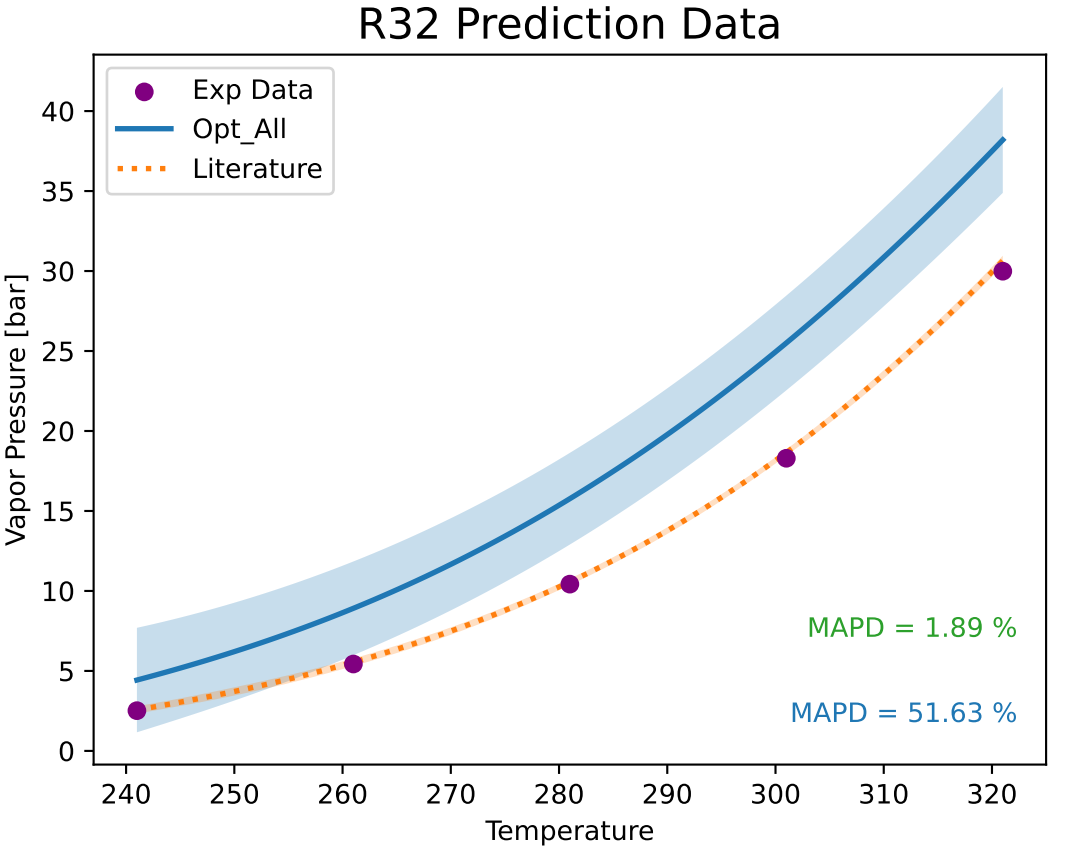

R14 Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
175
150
125
100
75
50
25
0
130
140
150
160
170
180
190
200
210
Temperature
MAPD = 1.65 %
MAPD = 26.50 %

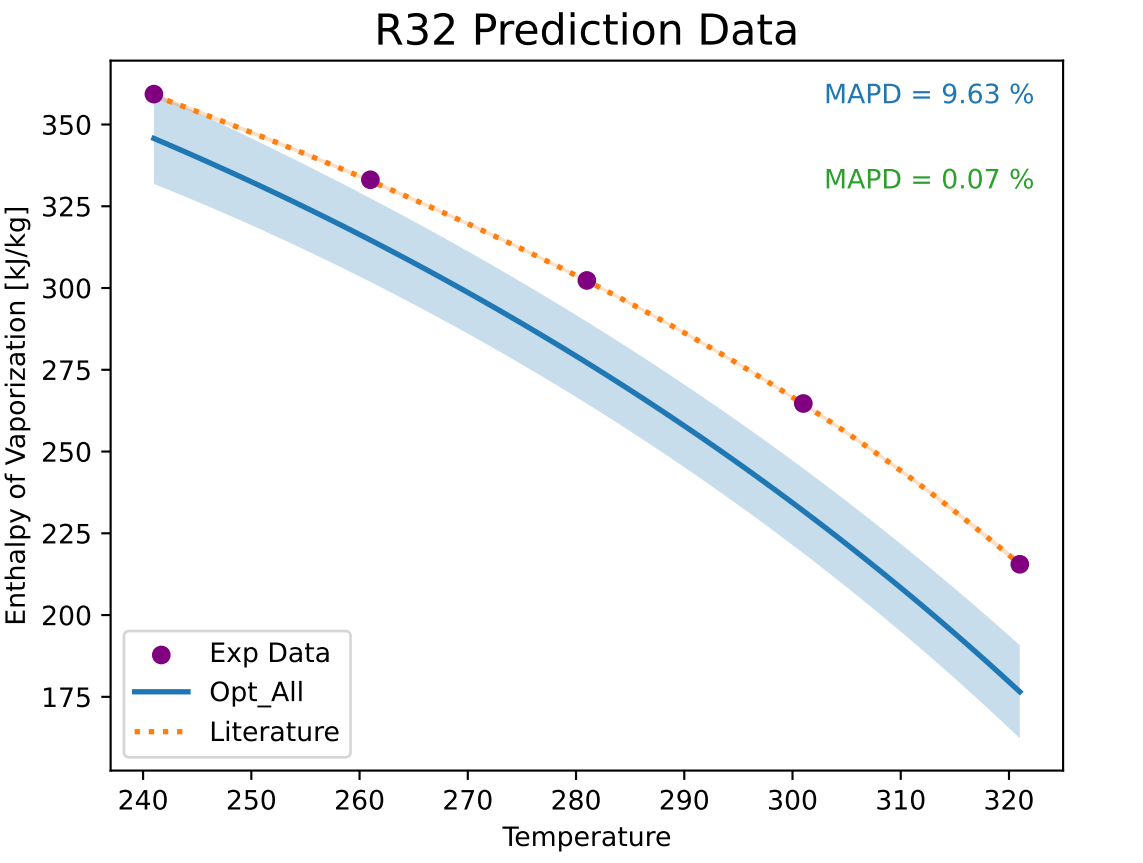

R14 Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
Temperature
MAPD = 6.24 %
MAPD = 10.38 %
0
5
10
15
20
130
140
150
160
170
180
190
200
210

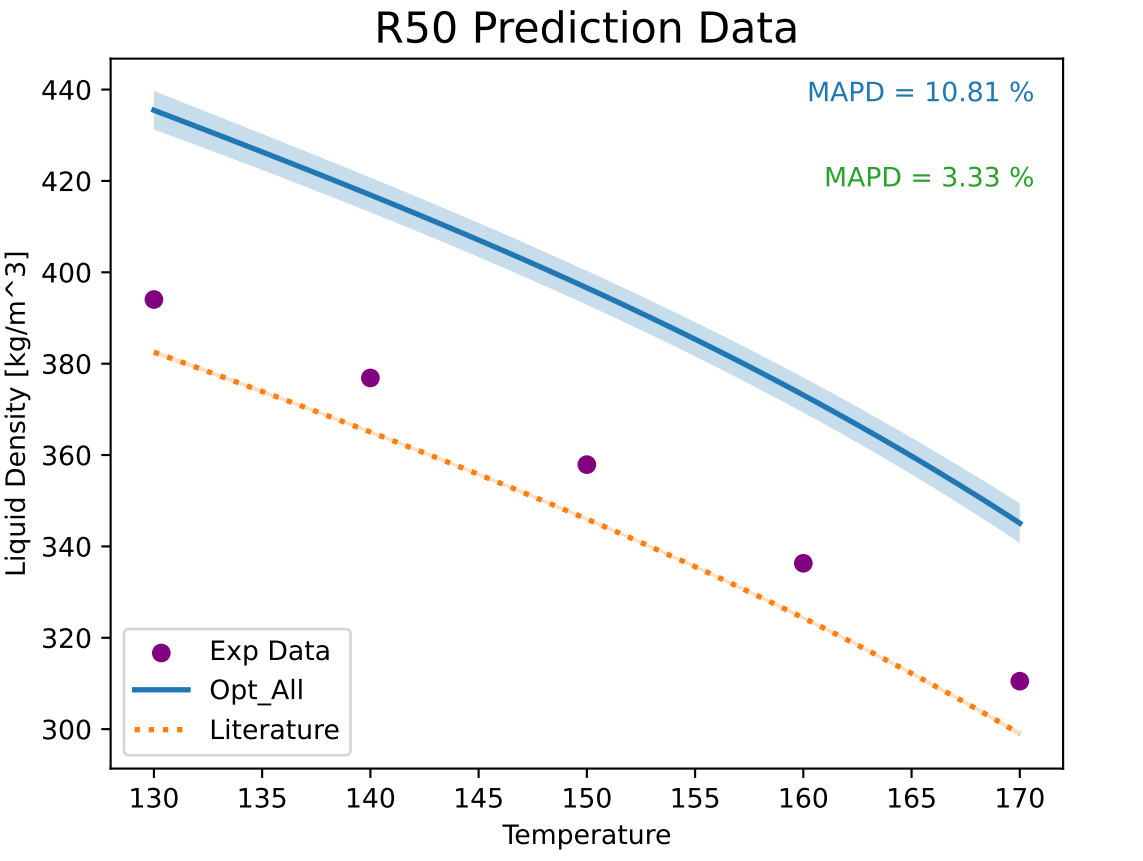

R14 Prediction Data
MAPD = 3.19 %
MAPD = 0.72 %
Enthalpy of Vaporization [kJ/kg]
Temperature
Exp Data
Opt_All
Literature
140
130
120
110
100
90
80
130
140
150
160
170
180
190
200
210

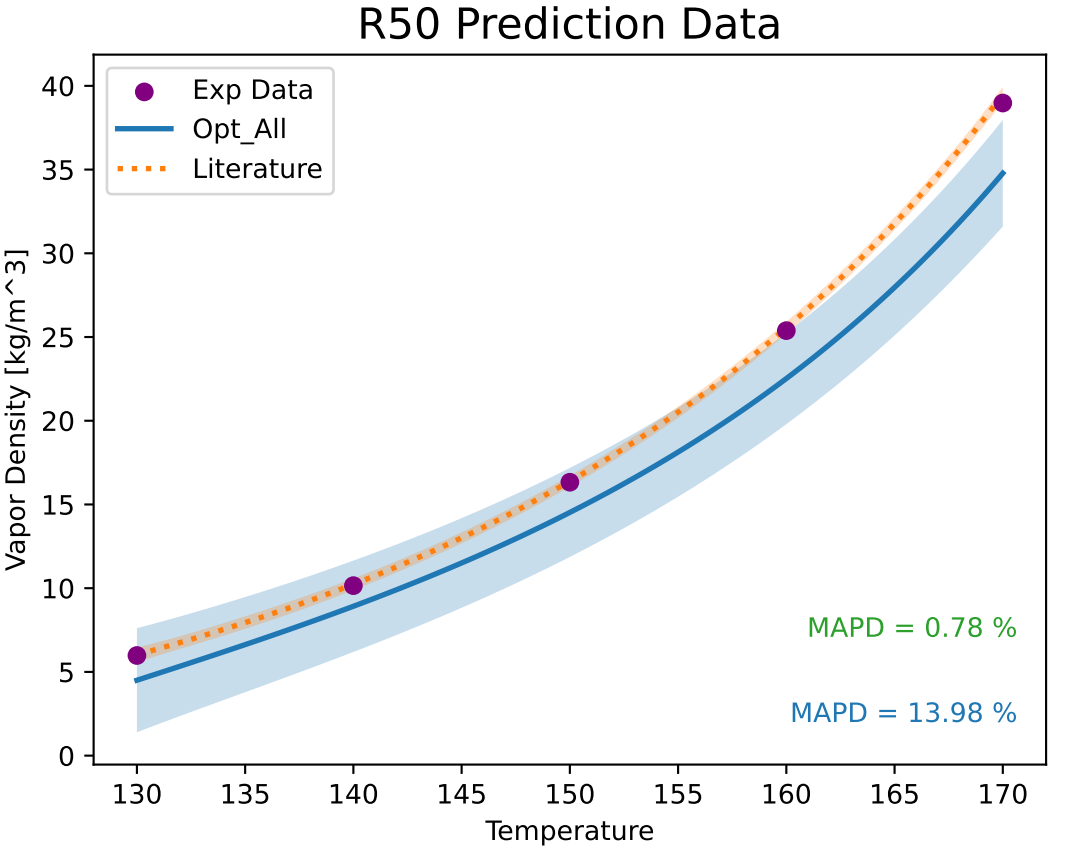

R32 Prediction Data
MAPD = 3.21 %
MAPD = 1.07 %
Liquid Density [kg/m^3]
1200
1100
1000
900
800
240
250
260
270
280
290
300
310
320
Temperature
Exp Data
Opt_All
Literature

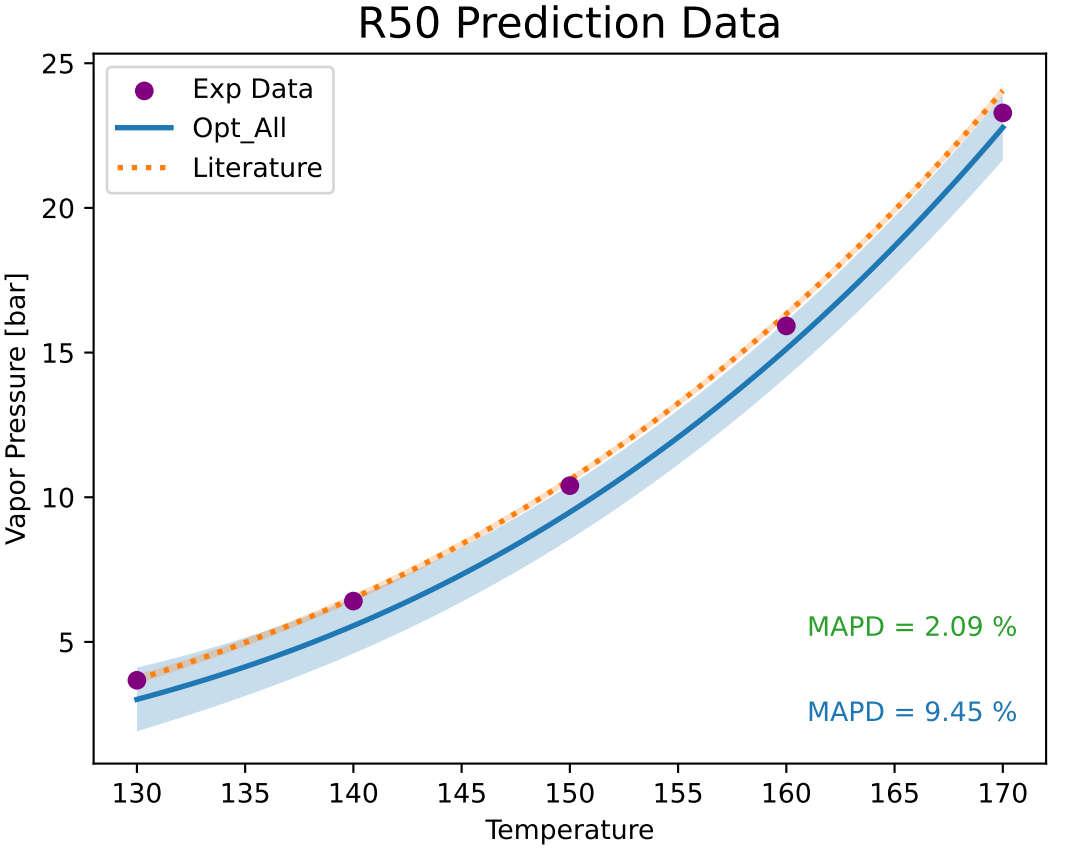

R32 Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 2.03 %
MAPD = 63.27 %
0
20
40
60
80
100
120
140
240
250
260
270
280
290
300
310
320

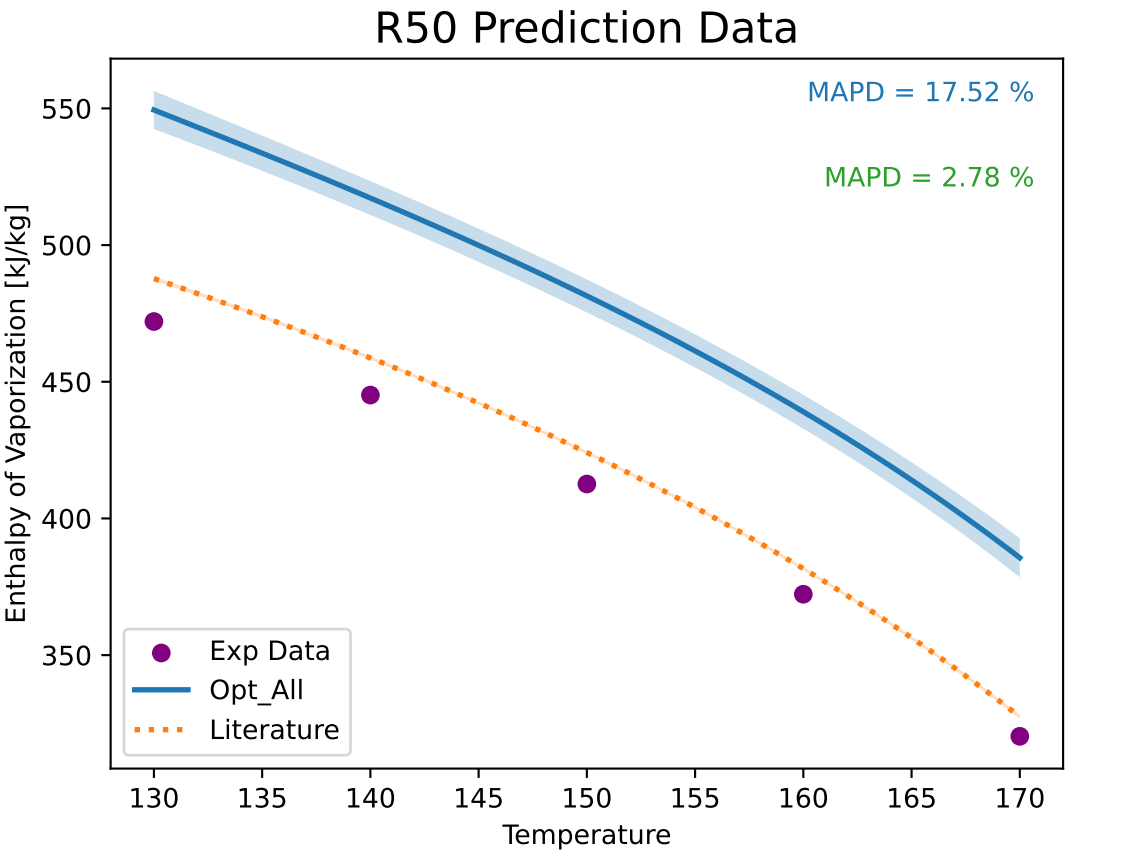

R32 Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
Temperature
0
5
10
15
20
25
30
35
40
240
250
260
270
280
290
300
310
320
MAPD = 1.89 %
MAPD = 51.63 %

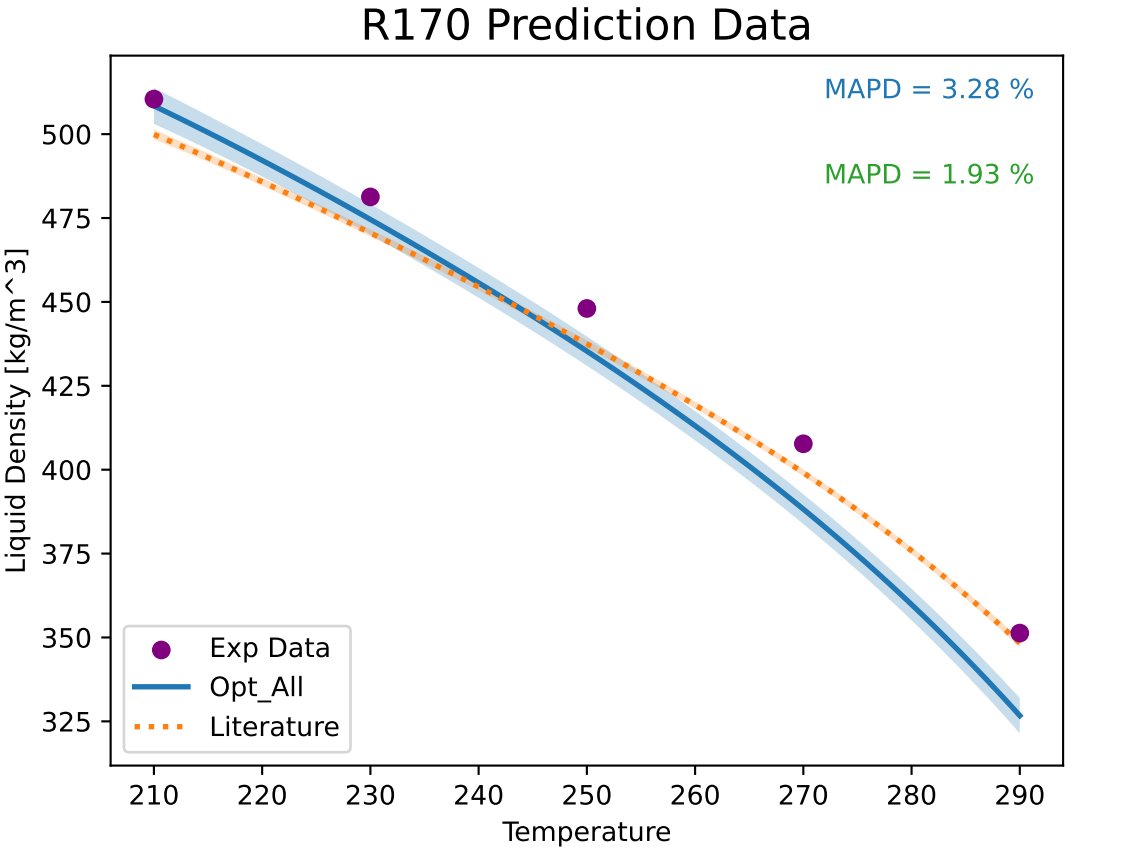

R32 Prediction Data
MAPD = 9.63 %
MAPD = 0.07 %
Enthalpy of Vaporization [kJ/kg]
Temperature
350
325
300
275
250
225
200
175
240
250
260
270
280
290
300
310
320
Exp Data
Opt_All
Literature

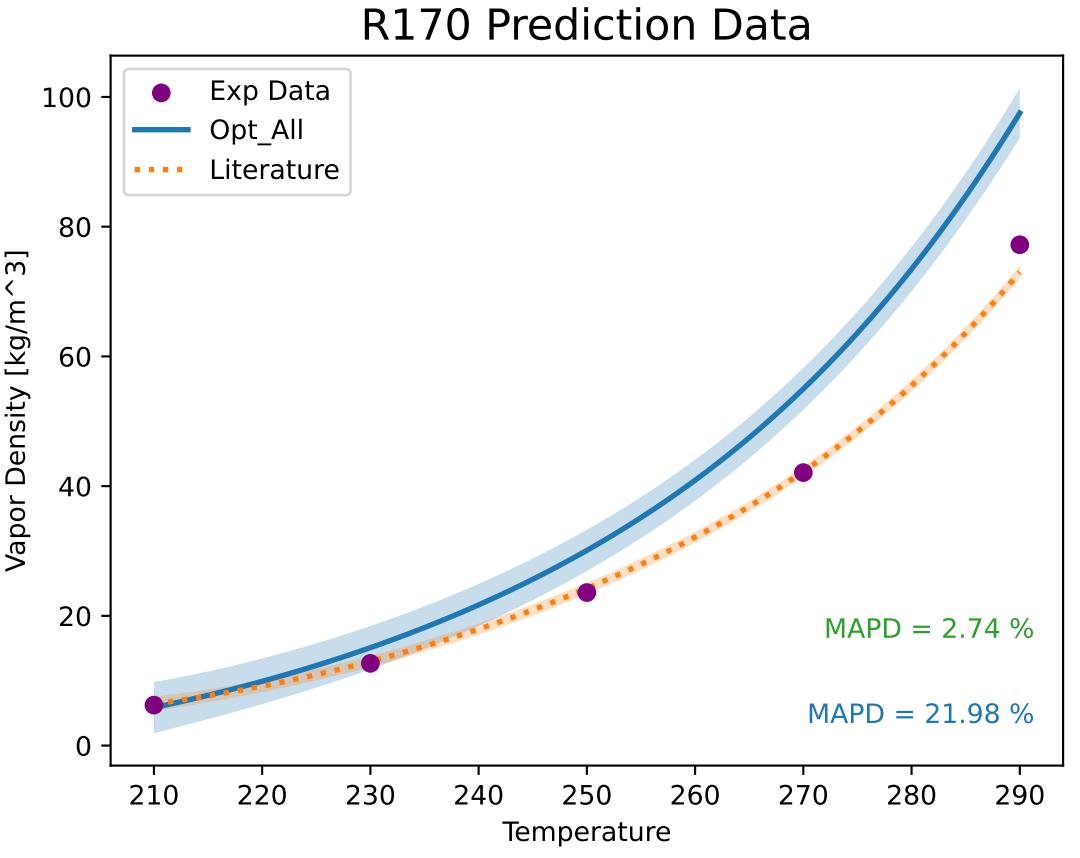

R50 Prediction Data
MAPD = 10.81 %
MAPD = 3.33 %
Liquid Density [kg/m^3]
Temperature
Exp Data
Opt_All
Literature
440
420
400
380
360
340
320
300
130
135
140
145
150
155
160
165
170

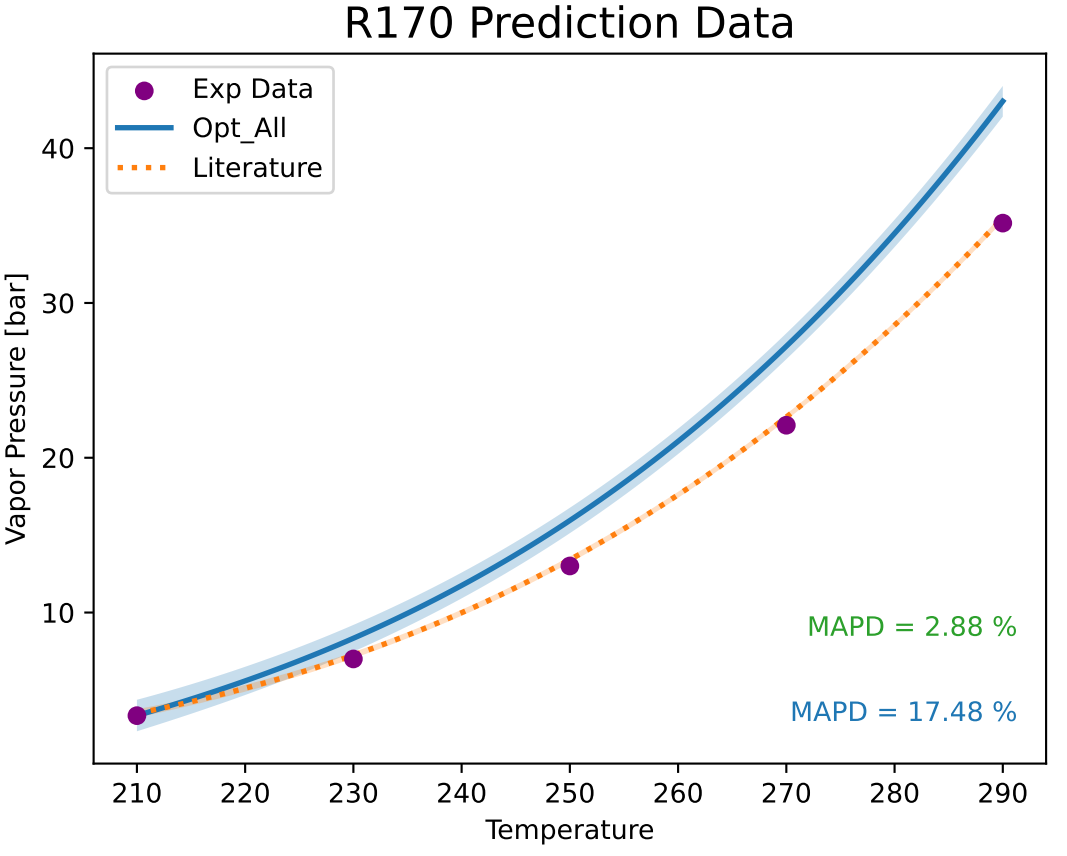

R50 Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 0.78 %
MAPD = 13.98 %
0
5
10
15
20
25
30
35
40
130
135
140
145
150
155
160
165
170

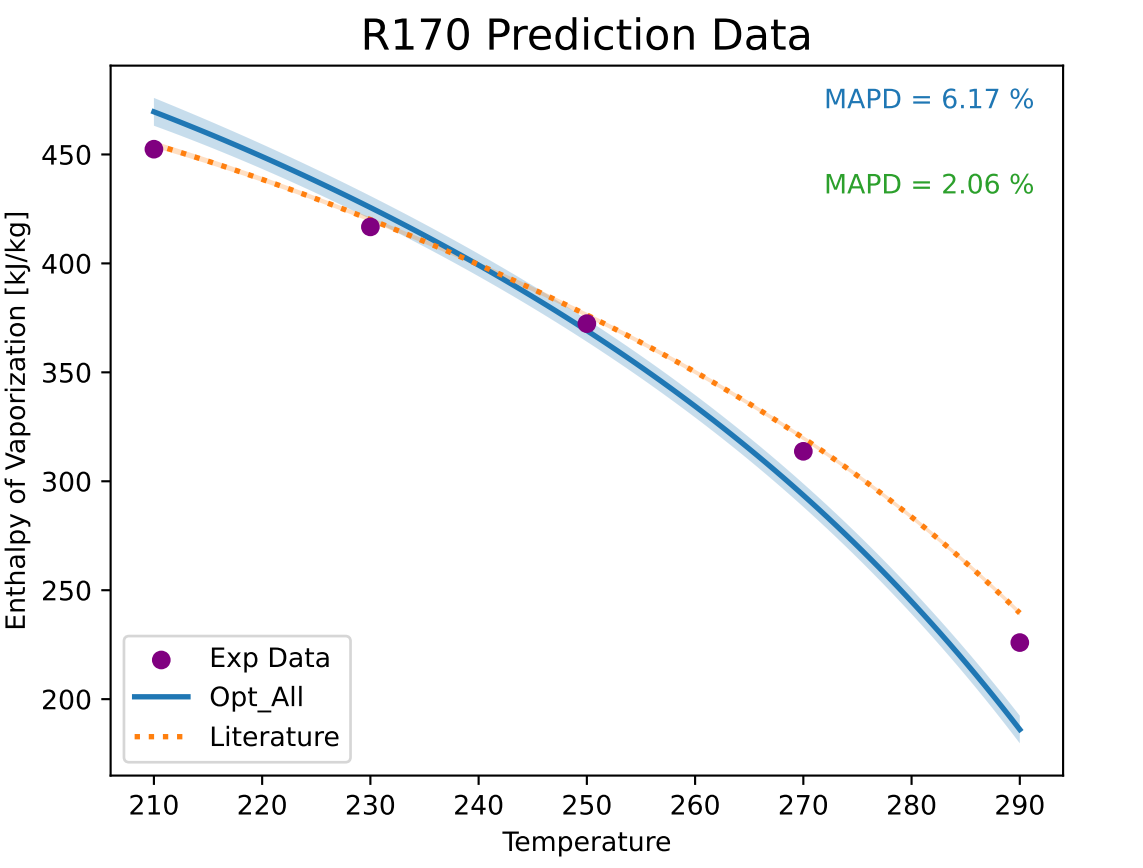

R50 Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
Temperature
25
20
15
10
5
130
135
140
145
150
155
160
165
170
MAPD = 2.09 %
MAPD = 9.45 %

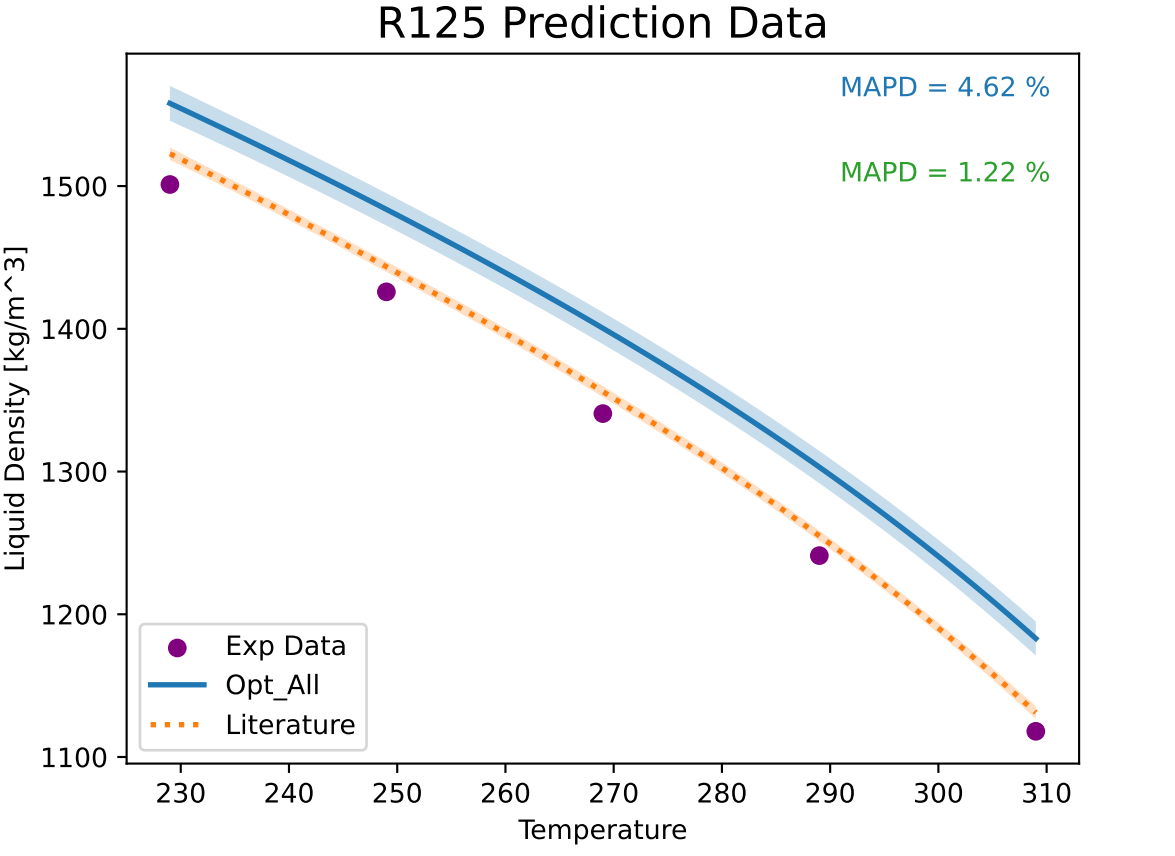

R50 Prediction Data
MAPD = 17.52 %
MAPD = 2.78 %
Enthalpy of Vaporization [kJ/kg]
550
500
450
400
350
Exp Data
Opt_All
Literature
130
135
140
145
150
155
160
165
170
Temperature

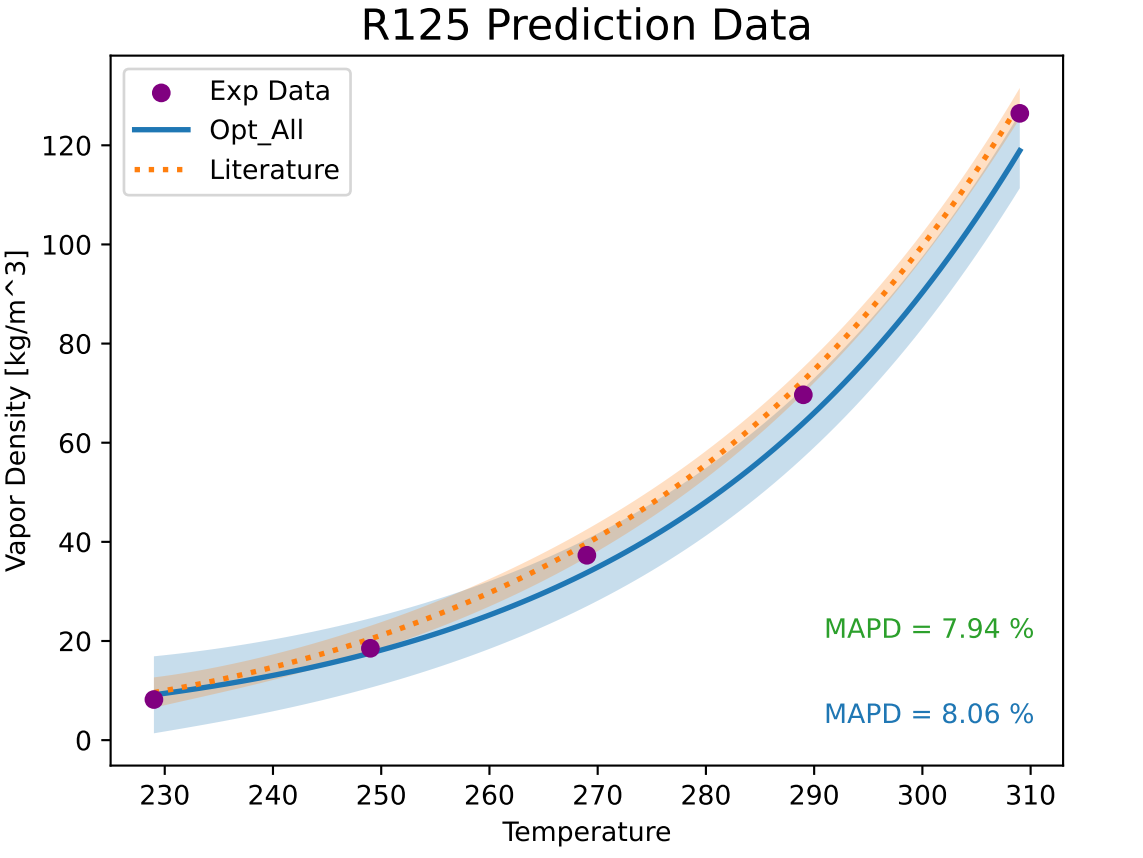

R170 Prediction Data
MAPD = 3.28 %
MAPD = 1.93 %
Liquid Density [kg/m^3]
500
475
450
425
400
375
350
325
210
220
230
240
250
260
270
280
290
Temperature
Exp Data
Opt_All
Literature

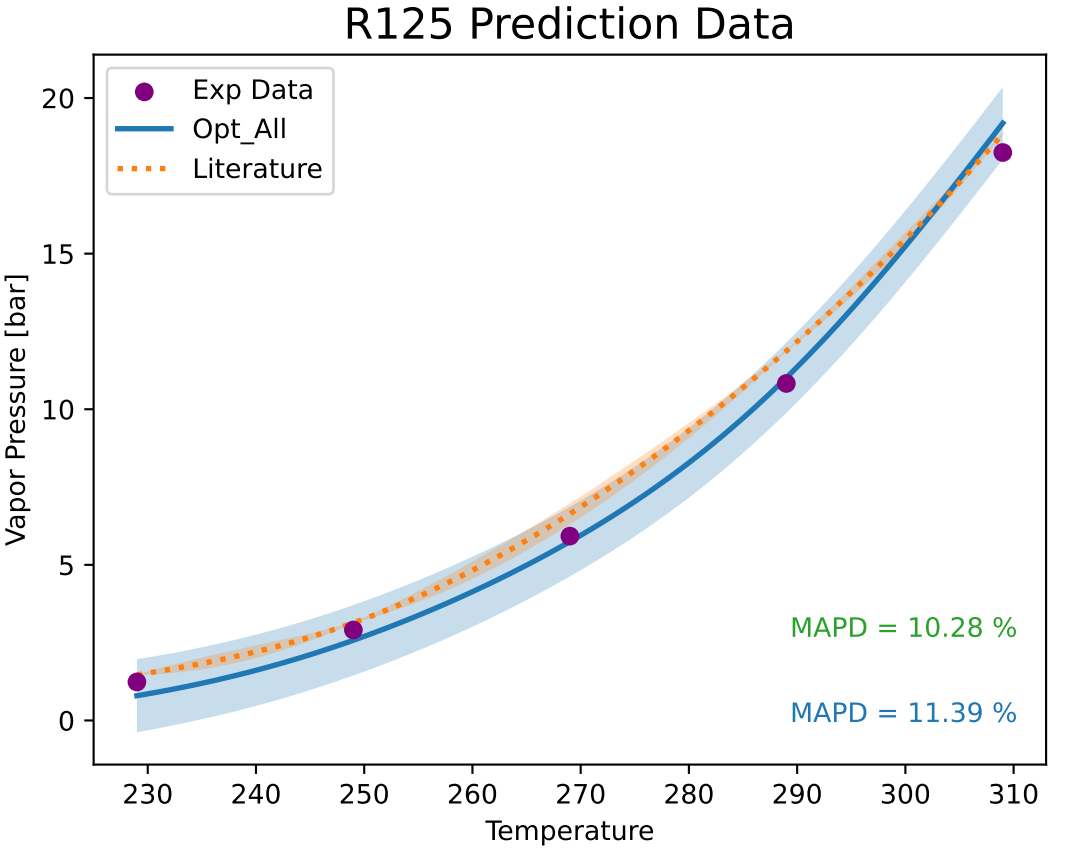

R170 Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 2.74 %
MAPD = 21.98 %
0
20
40
60
80
100
210
220
230
240
250
260
270
280
290

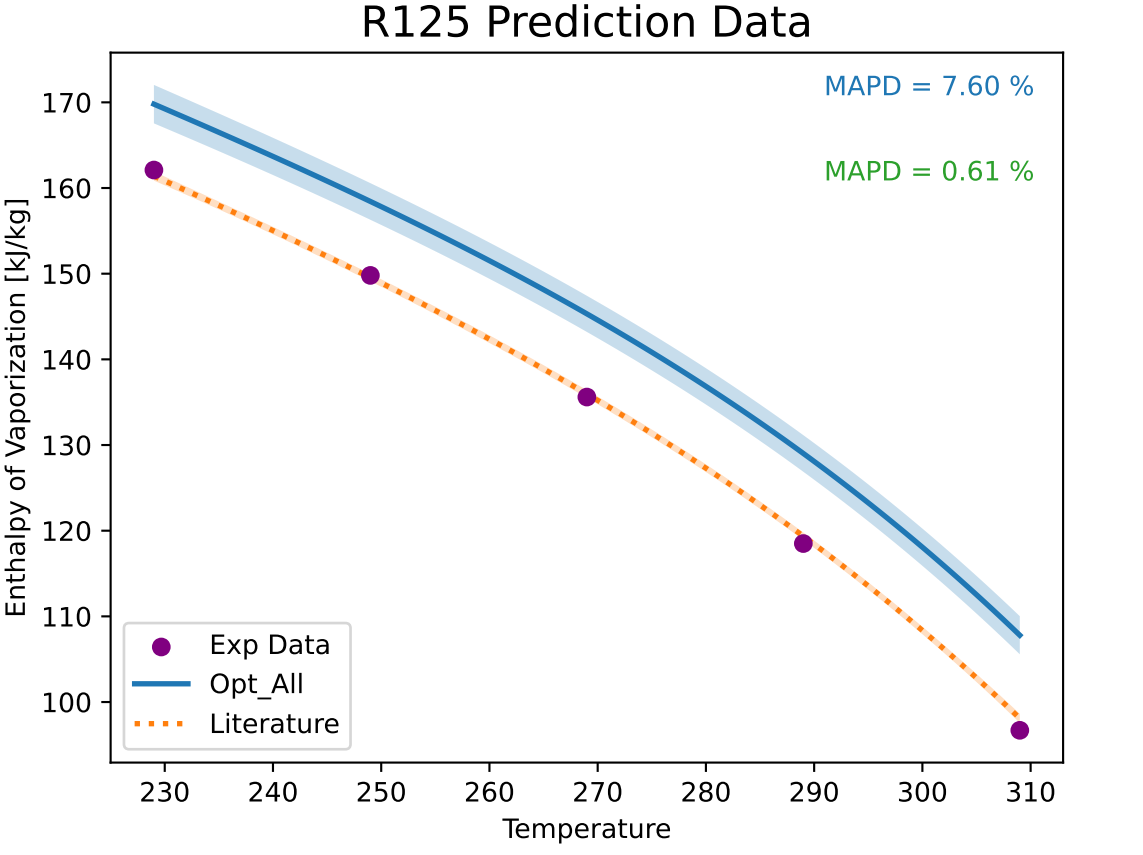

R170 Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
10
20
30
40
210
220
230
240
250
260
270
280
290
Temperature
MAPD = 2.88 %
MAPD = 17.48 %

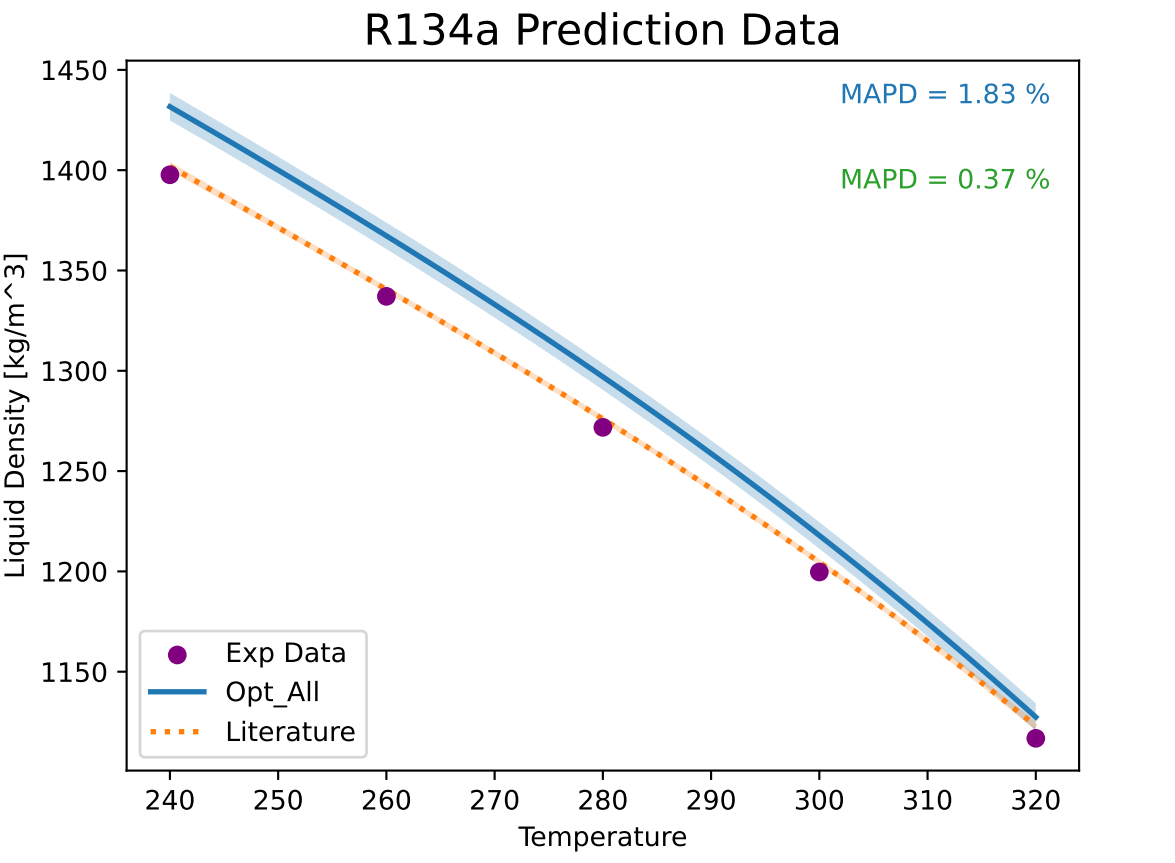

R170 Prediction Data
MAPD = 6.17 %
MAPD = 2.06 %
Enthalpy of Vaporization [kJ/kg]
Temperature
Exp Data
Opt_All
Literature
450
400
350
300
250
200
210
220
230
240
250
260
270
280
290

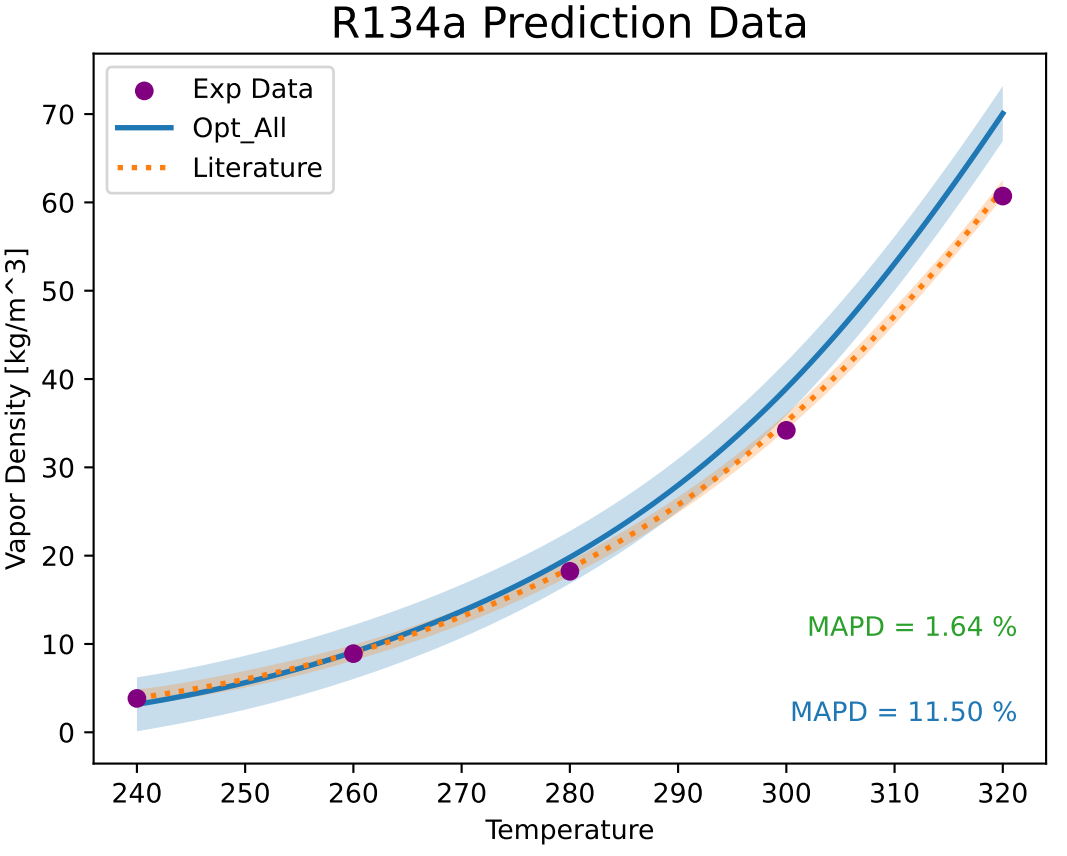

R125 Prediction Data
MAPD = 4.62 %
MAPD = 1.22 %
Liquid Density [kg/m^3]
1500
1400
1300
1200
1100
230
240
250
260
270
280
290
300
310
Temperature
Exp Data
Opt_All
Literature

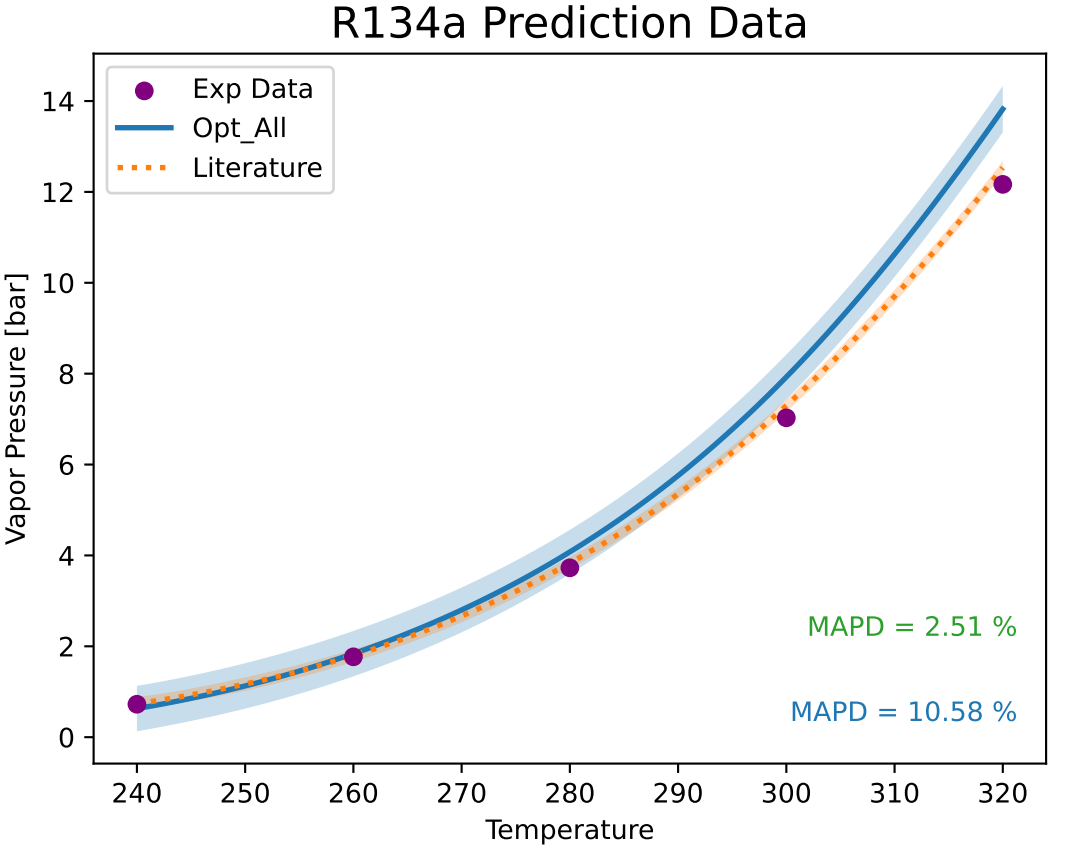

R125 Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 7.94 %
MAPD = 8.06 %
0
20
40
60
80
100
120
230
240
250
260
270
280
290
300
310

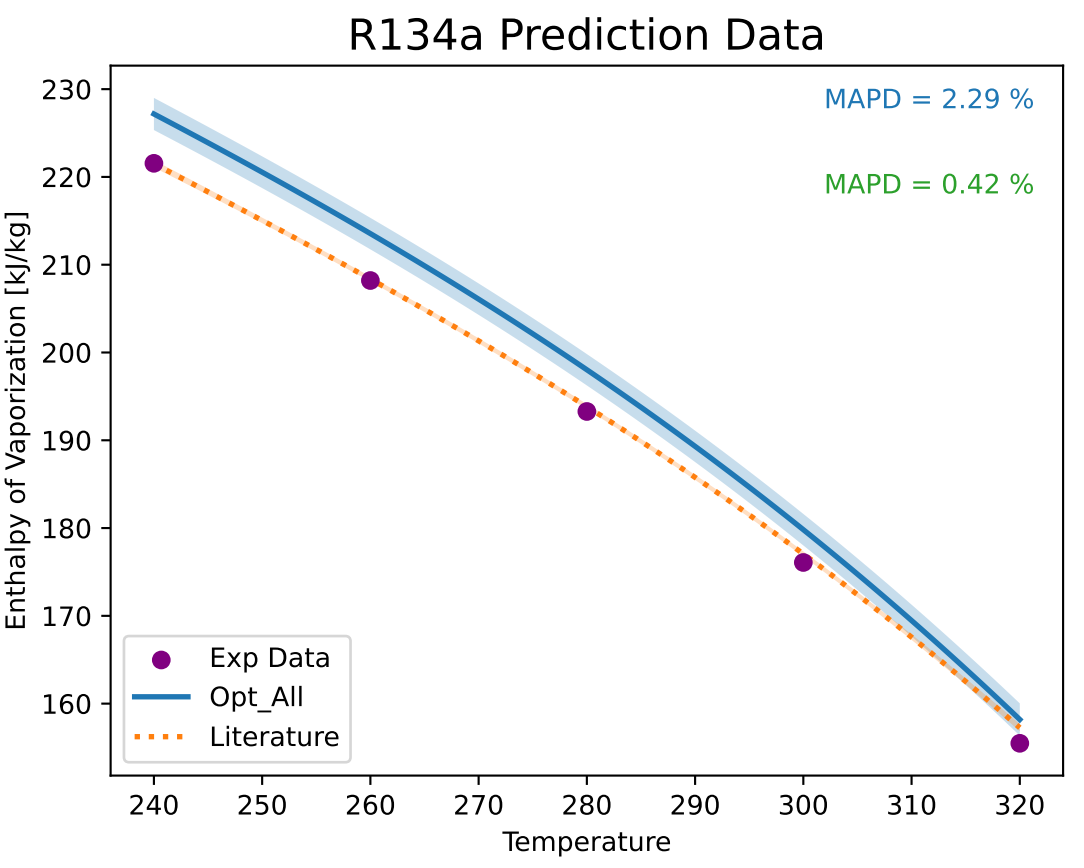

R125 Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
Temperature
0
5
10
15
20
230
240
250
260
270
280
290
300
310
MAPD = 10.28 %
MAPD = 11.39 %

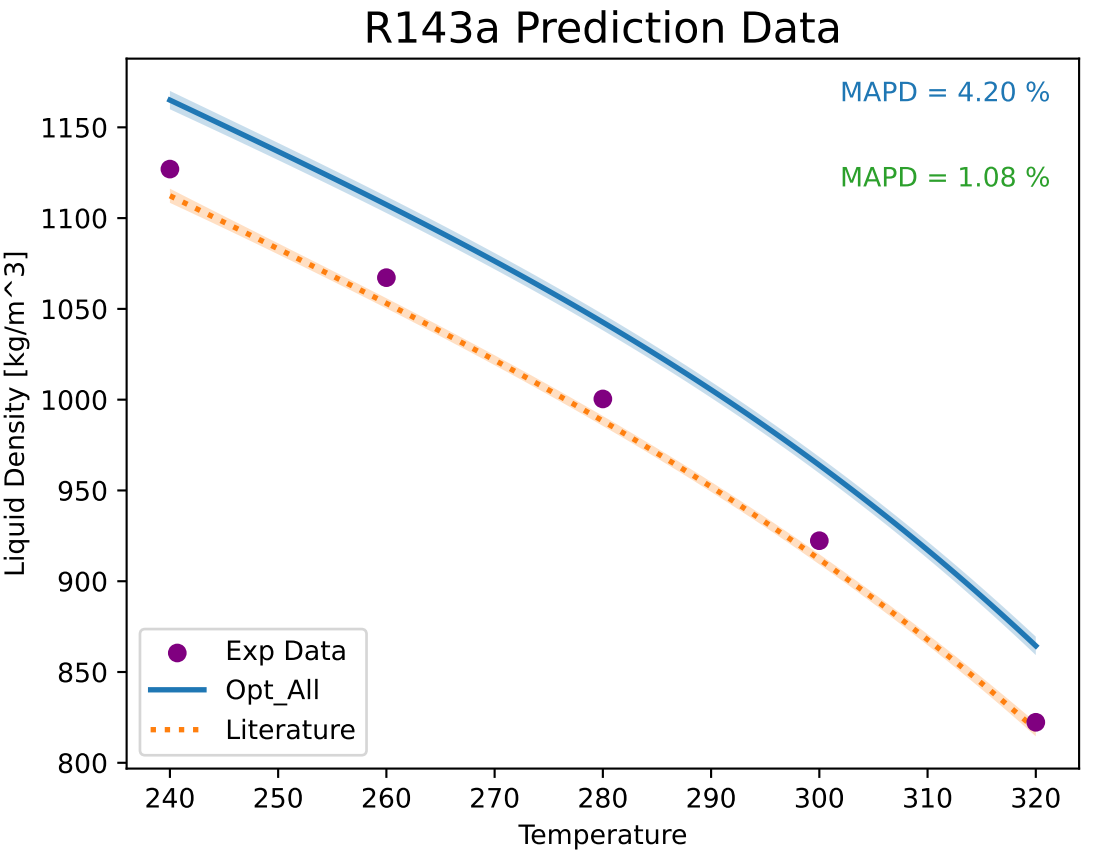

R125 Prediction Data
MAPD = 7.60 %
MAPD = 0.61 %
Enthalpy of Vaporization [kJ/kg]
Temperature
Exp Data
Opt_All
Literature
170
160
150
140
130
120
110
100
230
240
250
260
270
280
290
300
310

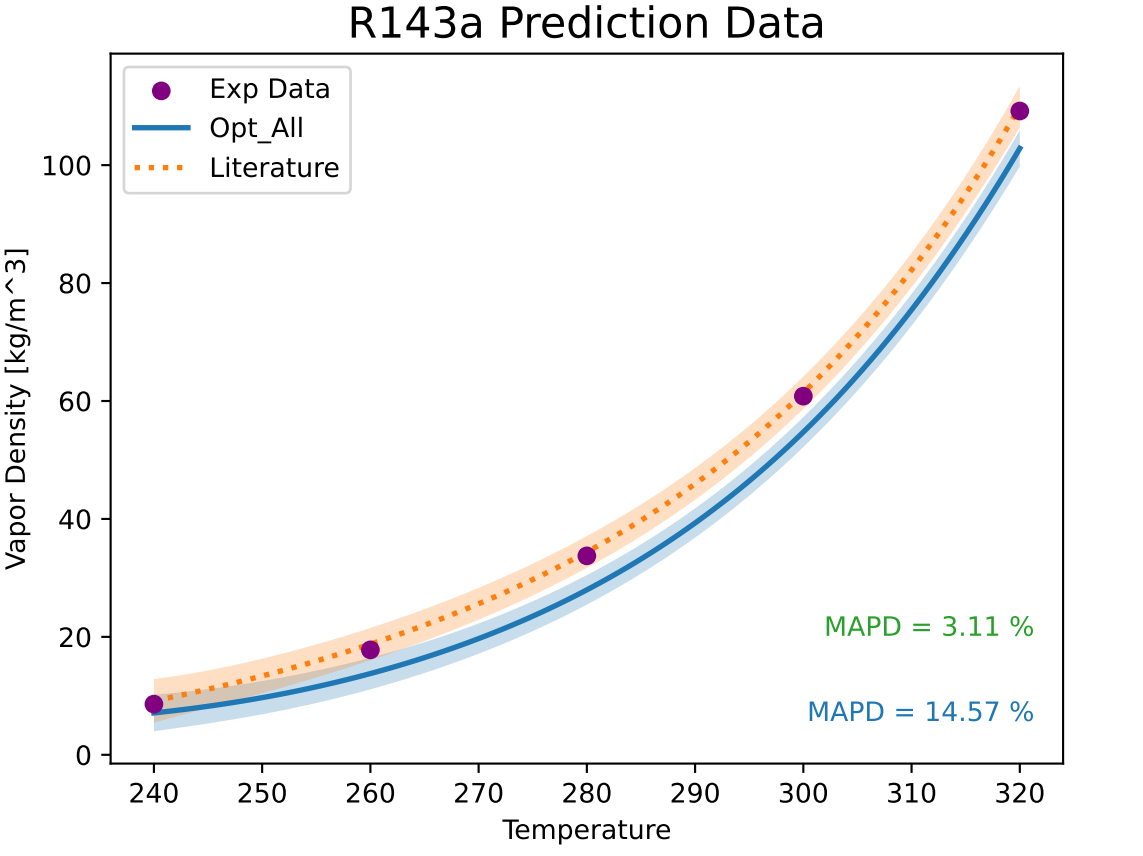

R134a Prediction Data
MAPD = 1.83 %
MAPD = 0.37 %
Liquid Density [kg/m^3]
Temperature
1450
1400
1350
1300
1250
1200
1150
240
250
260
270
280
290
300
310
320
Exp Data
Opt_All
Literature

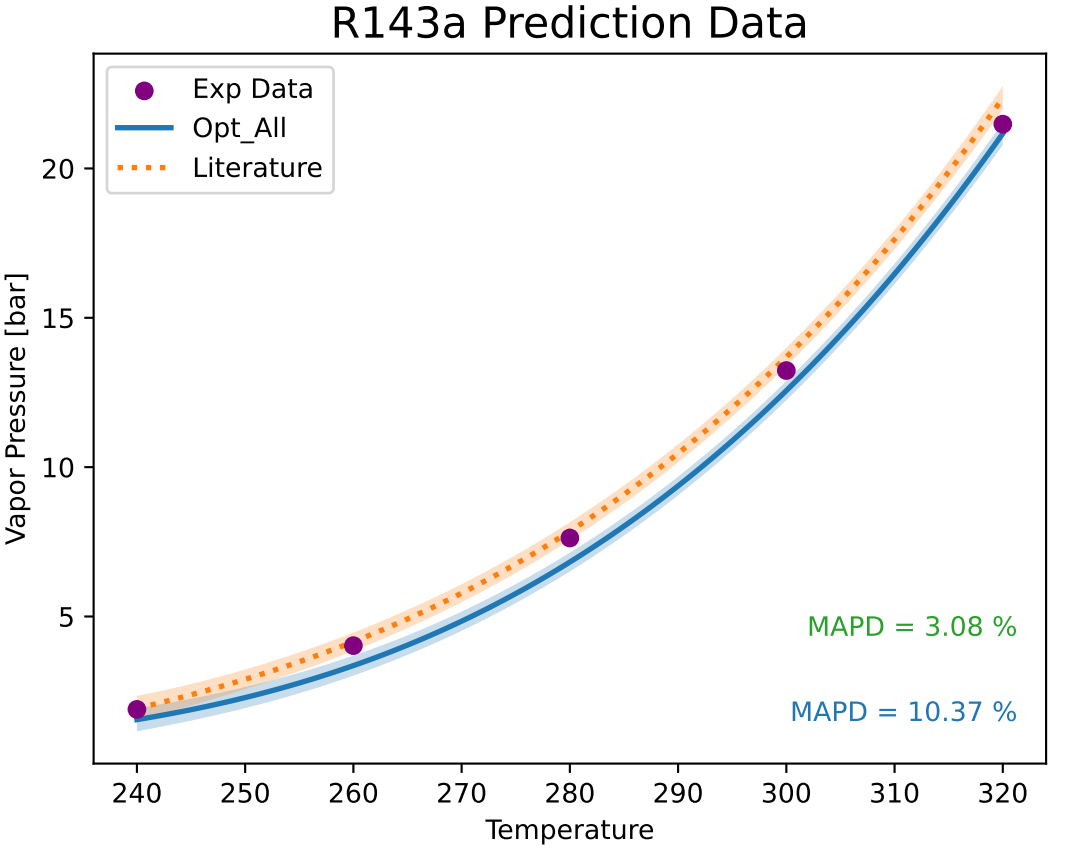

R134a Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 1.64 %
MAPD = 11.50 %
0
10
20
30
40
50
60
70
240
250
260
270
280
290
300
310
320

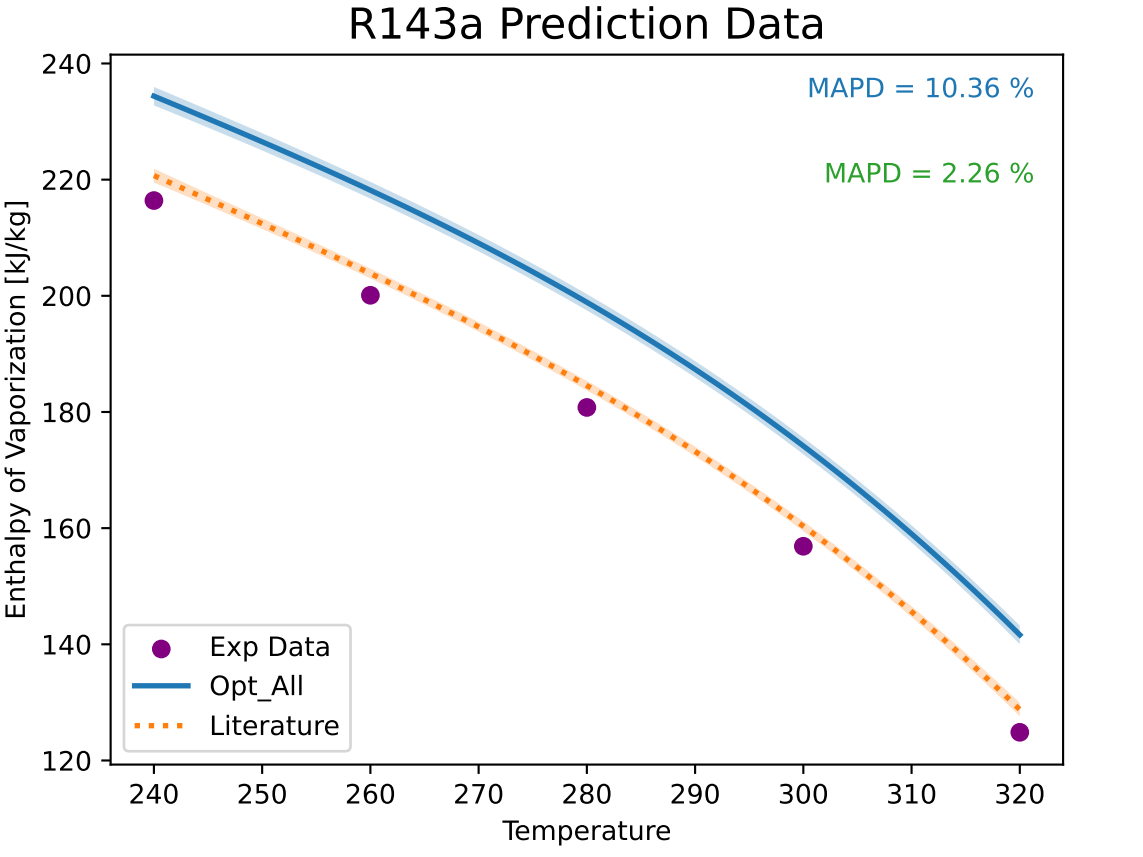

R134a Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
Temperature
MAPD = 2.51 %
MAPD = 10.58 %
0
2
4
6
8
10
12
14
240
250
260
270
280
290
300
310
320

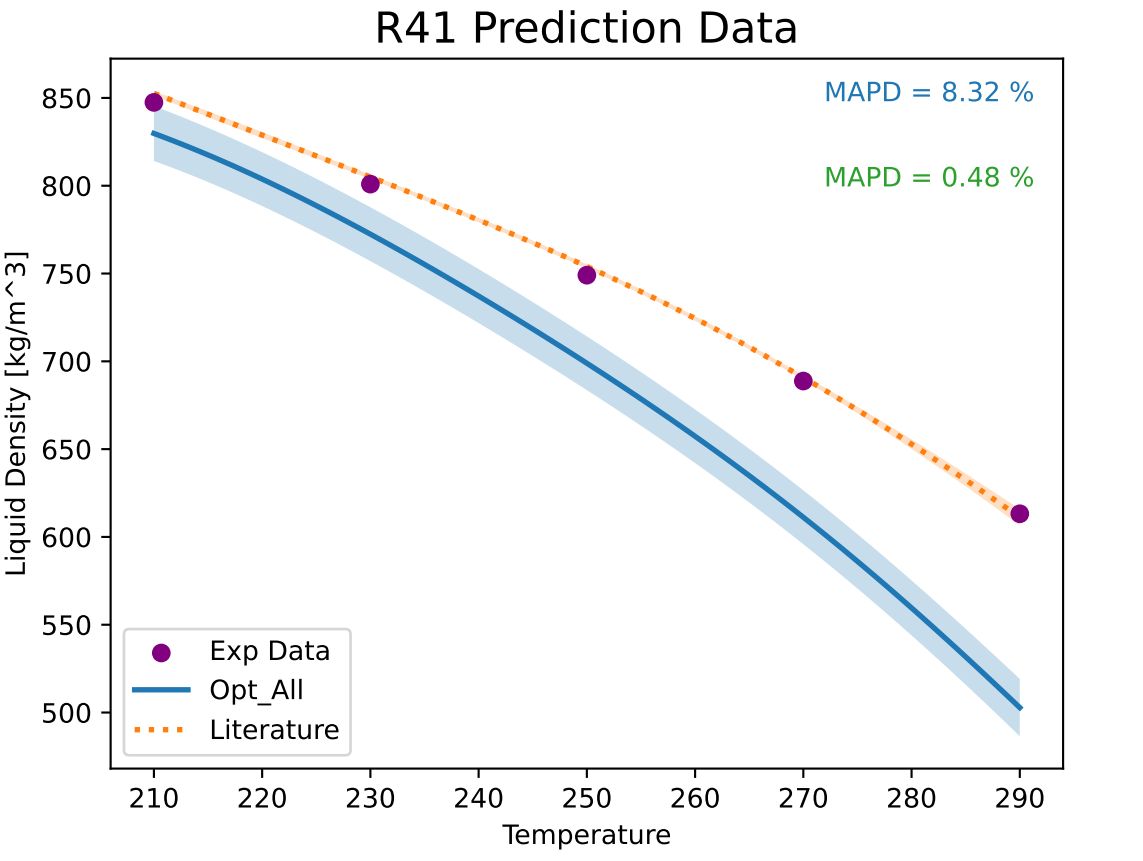

R134a Prediction Data
MAPD = 2.29 %
MAPD = 0.42 %
Exp Data
Opt_All
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
230
220
210
200
190
180
170
160
240
250
260
270
280
290
300
310
320

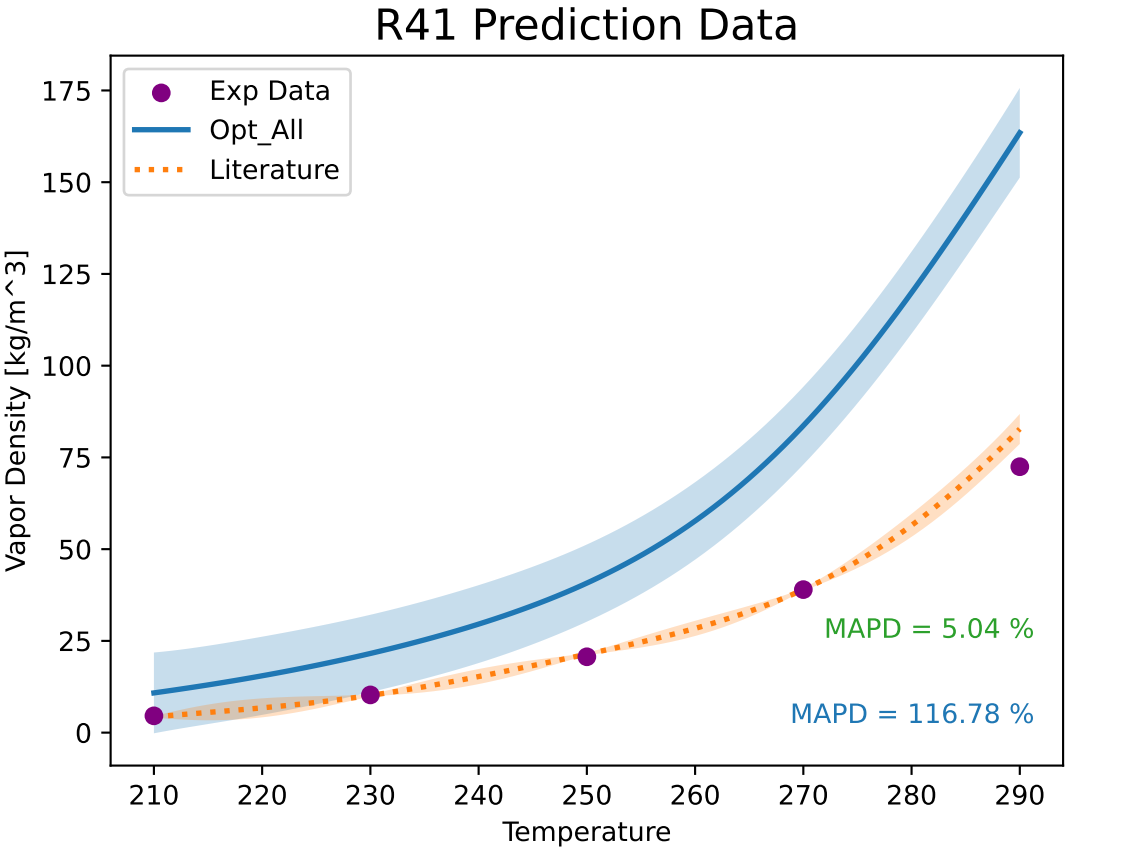

R143a Prediction Data
MAPD = 4.20 %
MAPD = 1.08 %
Liquid Density [kg/m^3]
Temperature
Exp Data
Opt_All
Literature
1150
1100
1050
1000
950
900
850
800
240
250
260
270
280
290
300
310
320

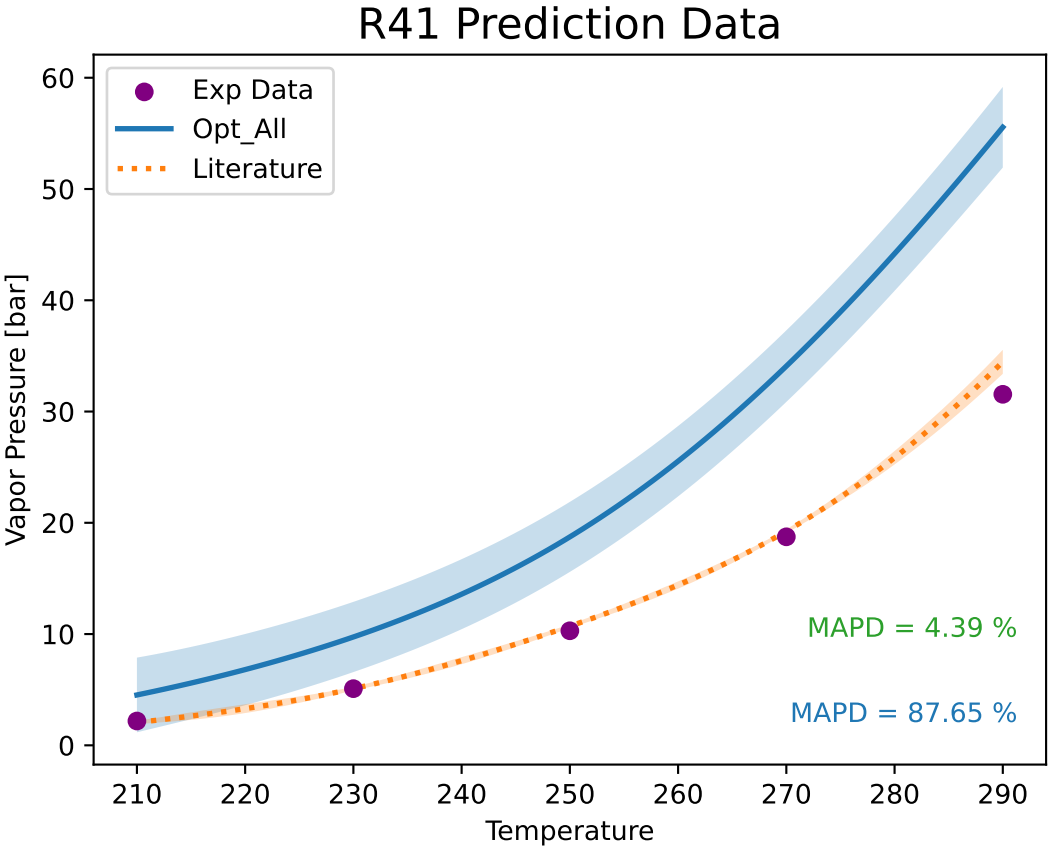

R143a Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
0
20
40
60
80
100
240
250
260
270
280
290
300
310
320
Temperature
MAPD = 3.11 %
MAPD = 14.57 %

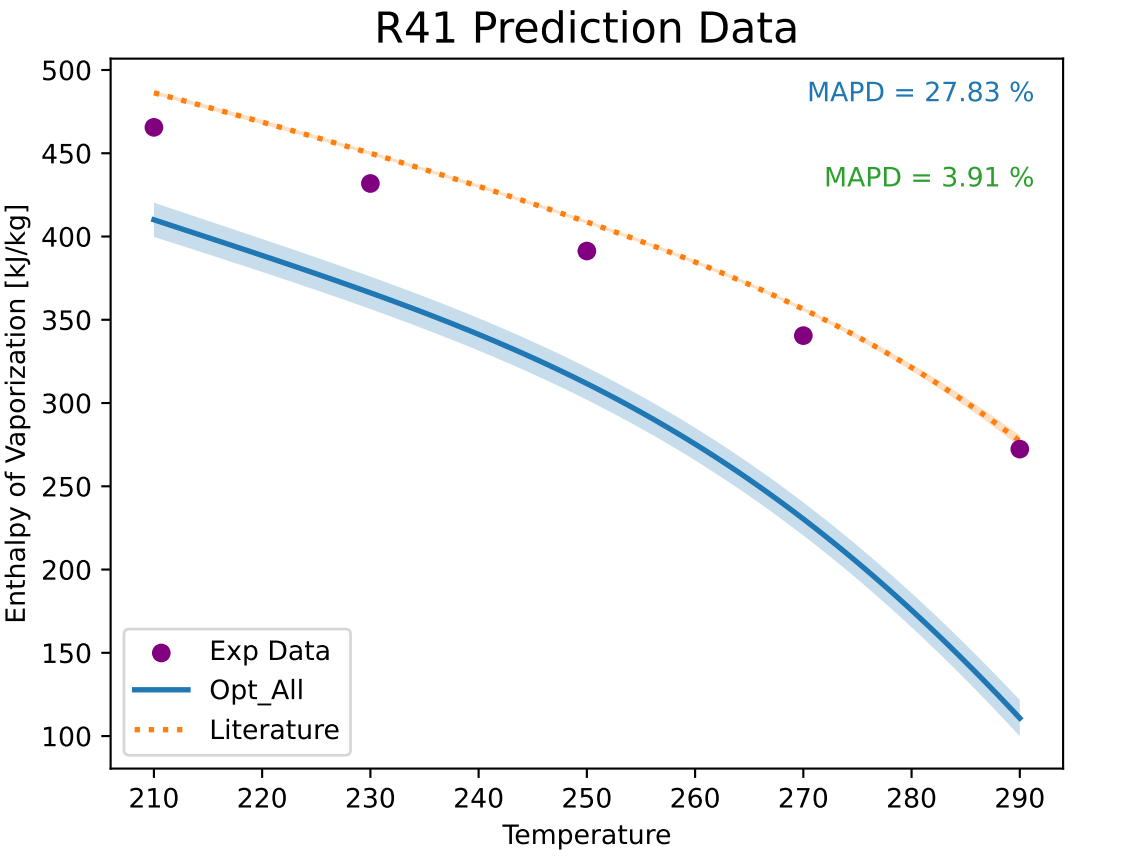

R143a Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
5
10
15
20
240
250
260
270
280
290
300
310
320
Temperature
MAPD = 3.08 %
MAPD = 10.37 %


R143a Prediction Data
MAPD = 10.36 %
MAPD = 2.26 %
Exp Data
Opt_All
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
240
220
200
180
160
140
120
240
250
260
270
280
290
300
310
320


R41 Prediction Data
MAPD = 8.32 %
MAPD = 0.48 %
Liquid Density [kg/m^3]
Temperature
850
800
750
700
650
600
550
500
210
220
230
240
250
260
270
280
290
Exp Data
Opt_All
Literature


R41 Prediction Data
Exp Data
Opt_All
Literature
MAPD = 5.04 %
MAPD = 116.78 %
Vapor Density [kg/m^3]
Temperature
175
150
125
100
75
50
25
0
210
220
230
240
250
260
270
280
290


R41 Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
Temperature
MAPD = 4.39 %
MAPD = 87.65 %
0
10
20
30
40
50
60
210
220
230
240
250
260
270
280
290


R41 Prediction Data
MAPD = 27.83 %
MAPD = 3.91 %
Enthalpy of Vaporization [kJ/kg]
Temperature
Exp Data
Opt_All
Literature
500
450
400
350
300
250
200
150
100
210
220
230
240
250
260
270
280
290