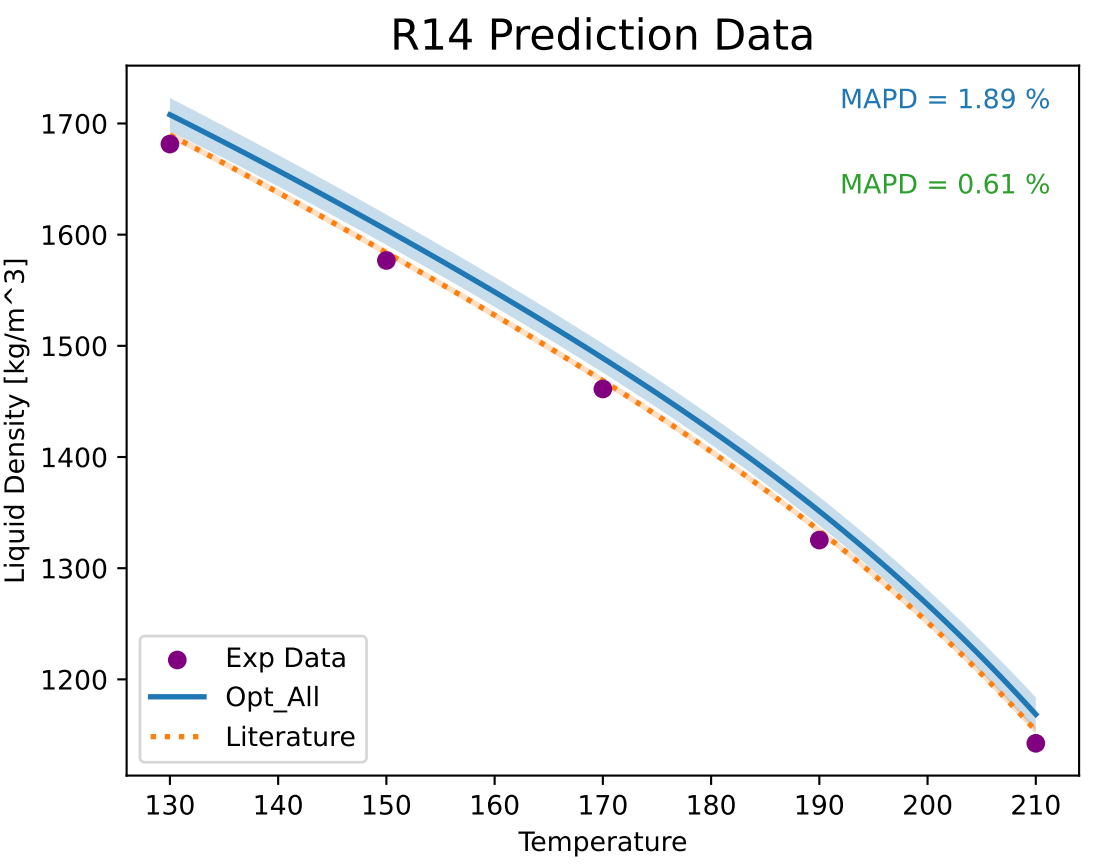
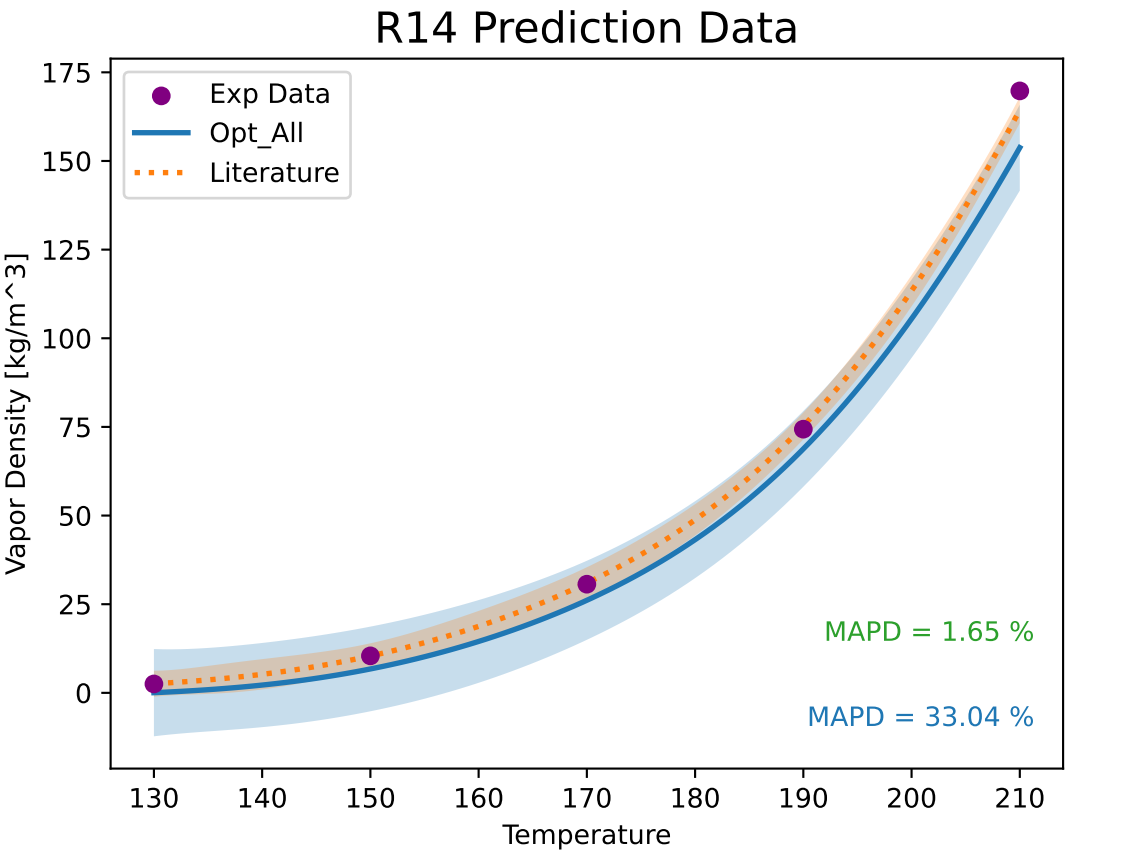
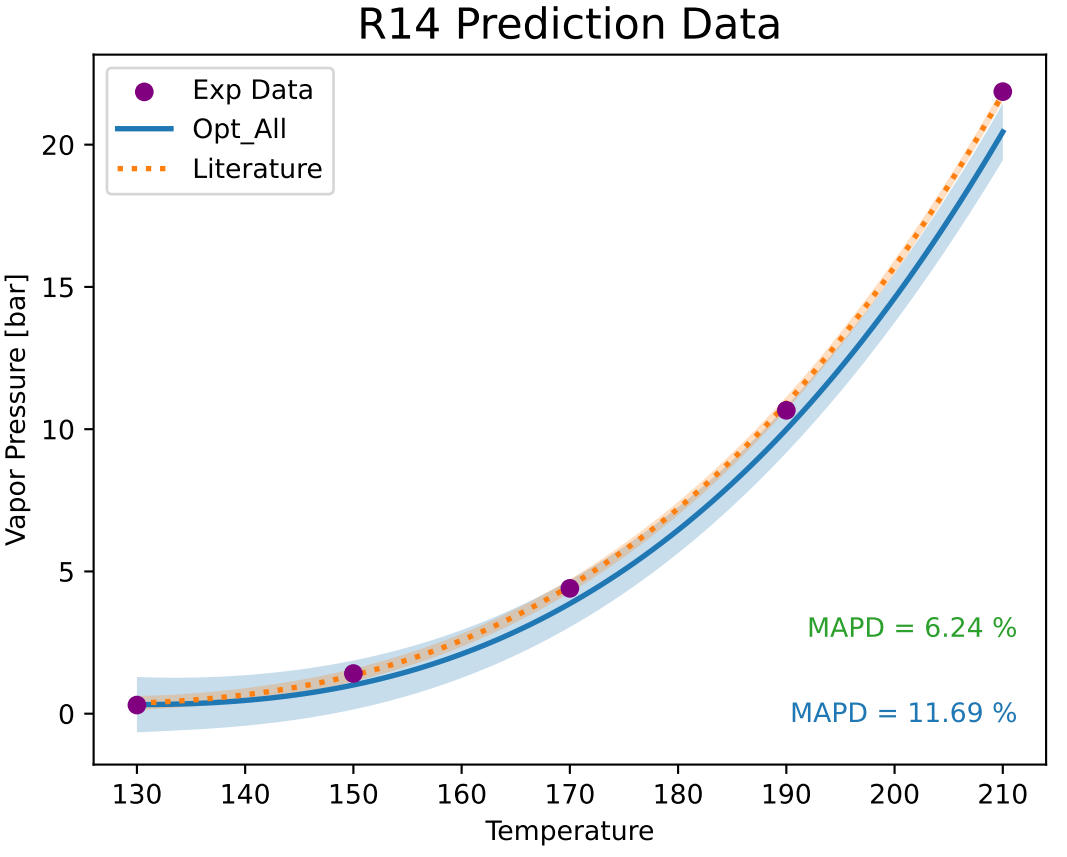
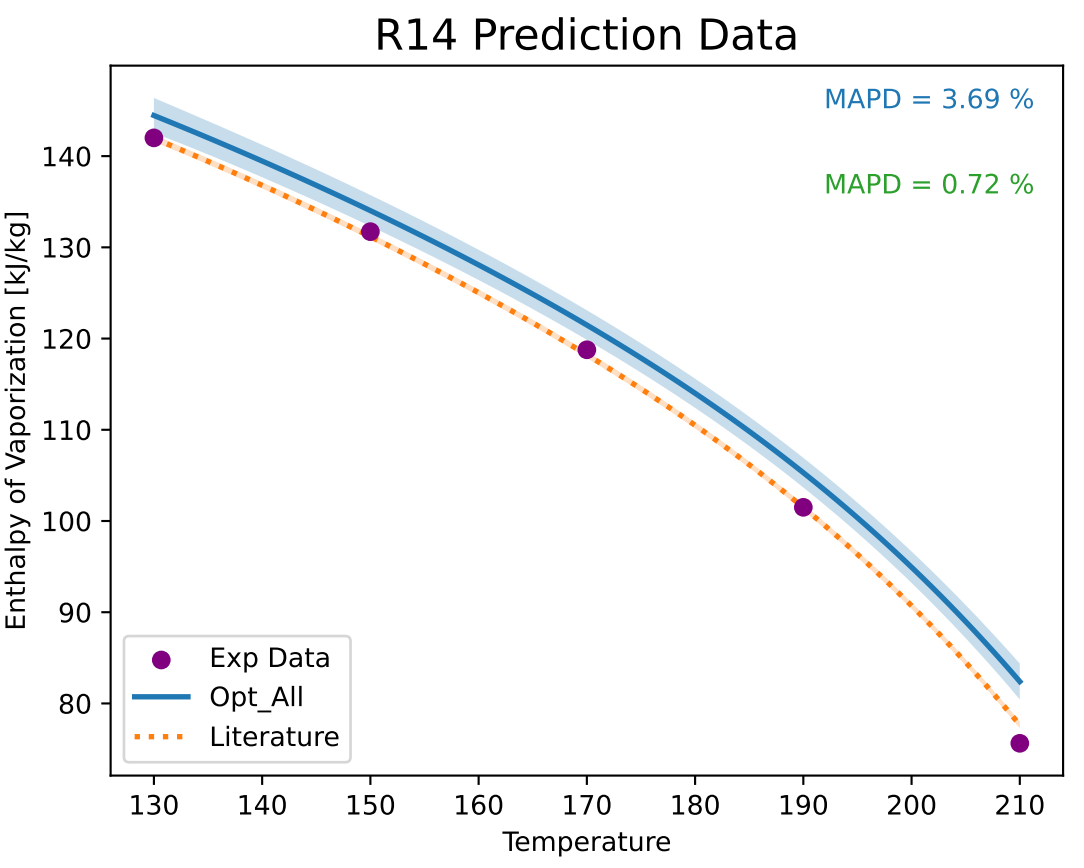
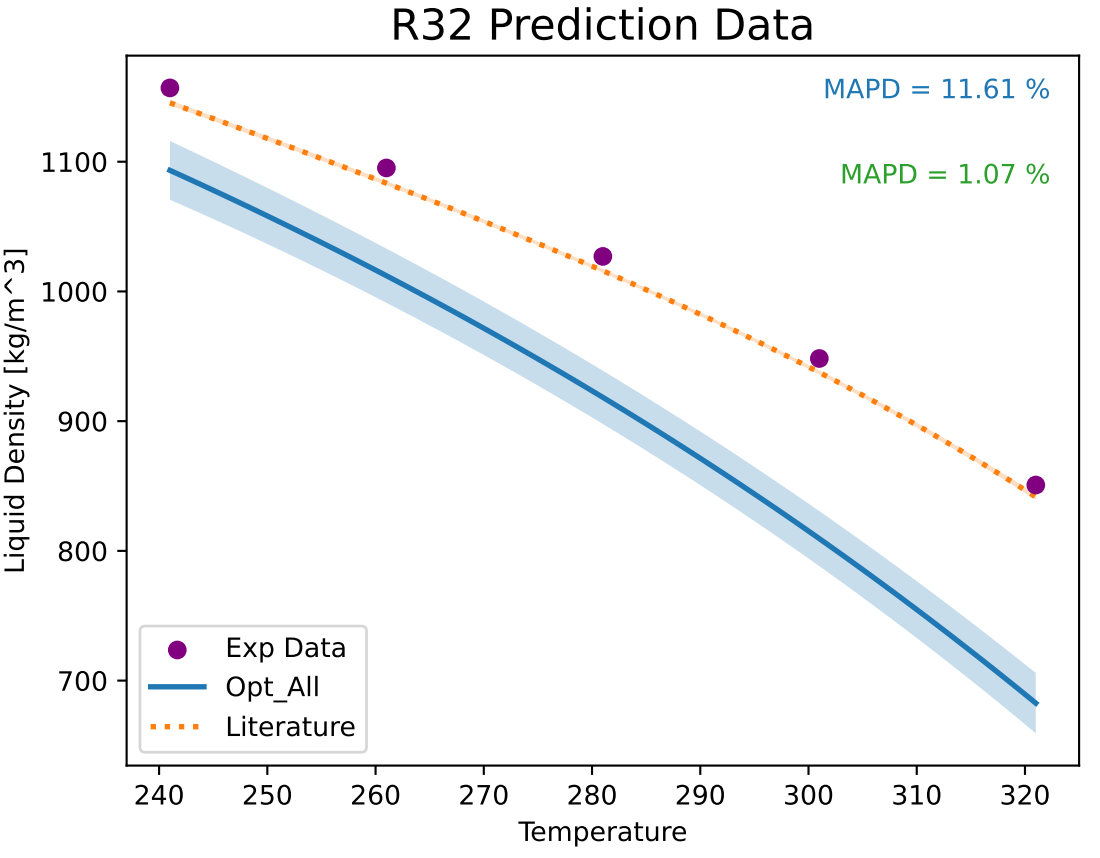
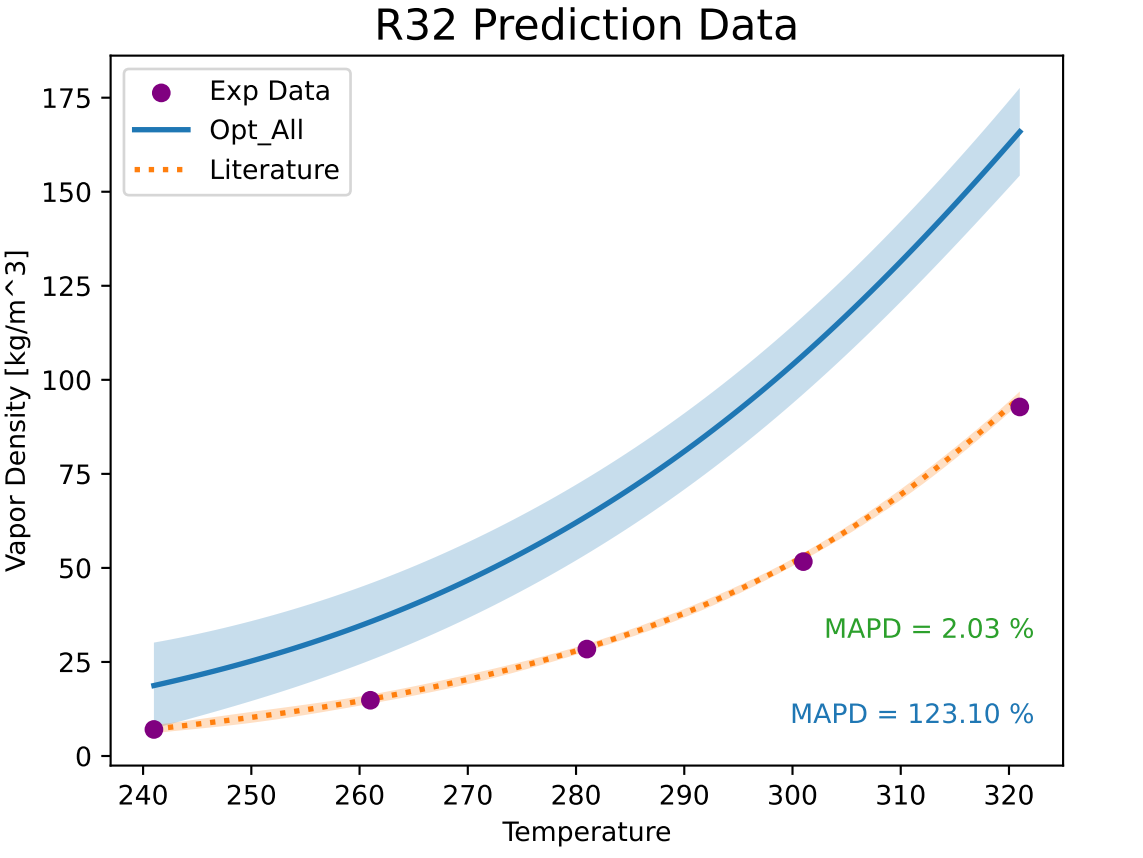

R14 Prediction Data
MAPD = 1.89 %
MAPD = 0.61 %
Liquid Density [kg/m^3]
1700
1600
1500
1400
1300
1200
130
140
150
160
170
180
190
200
210
Temperature
Exp Data
Opt_All
Literature

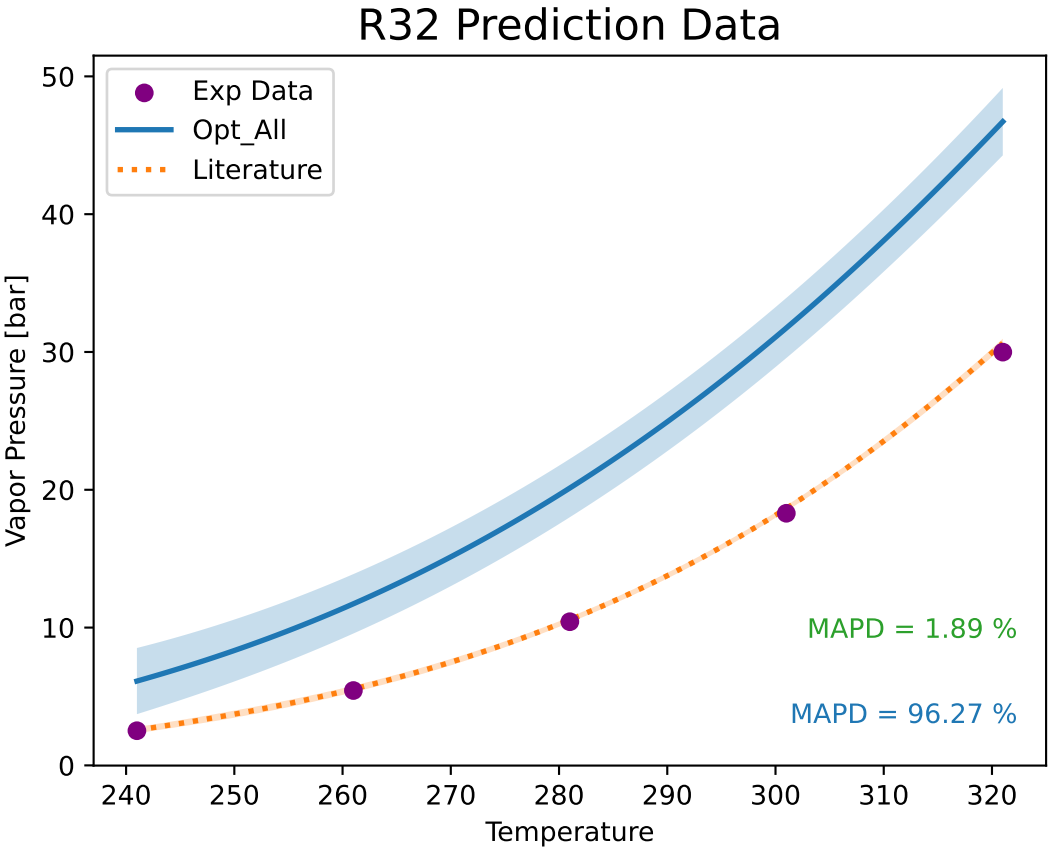

R14 Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
175
150
125
100
75
50
25
0
130
140
150
160
170
180
190
200
210
Temperature
MAPD = 1.65 %
MAPD = 33.04 %

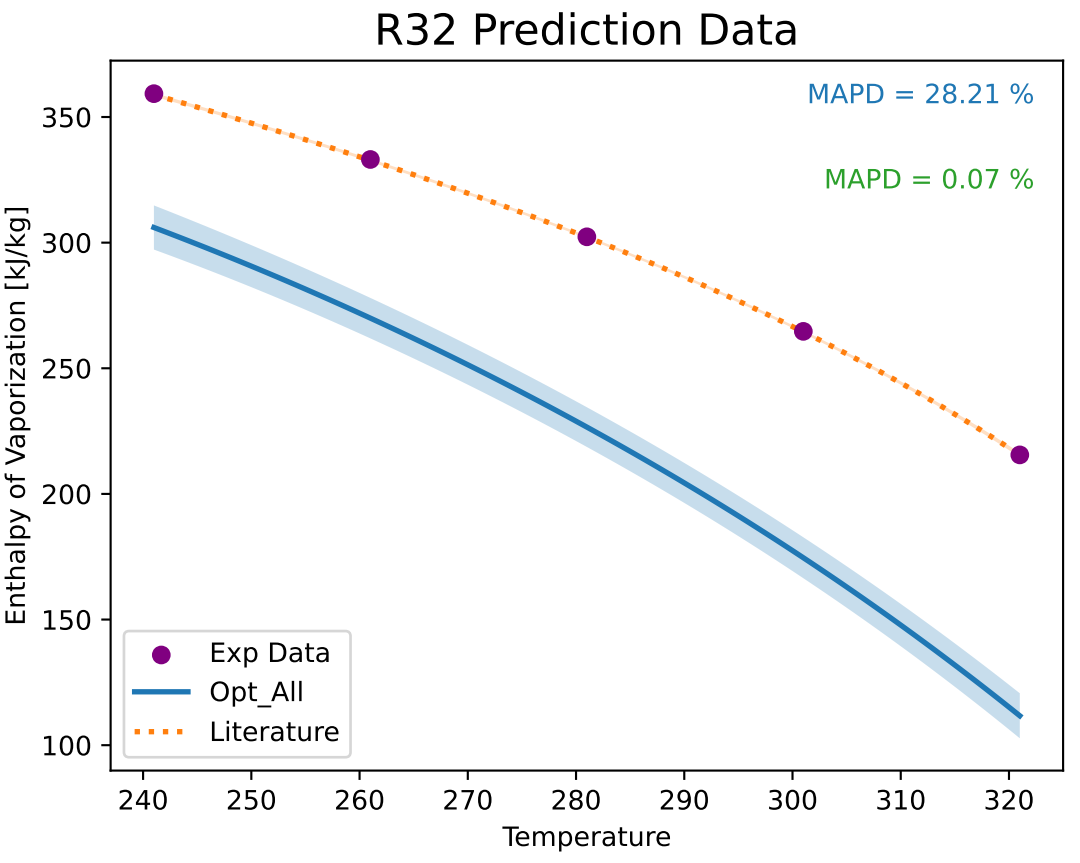

R14 Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
Temperature
MAPD = 6.24 %
MAPD = 11.69 %
0
5
10
15
20
130
140
150
160
170
180
190
200
210

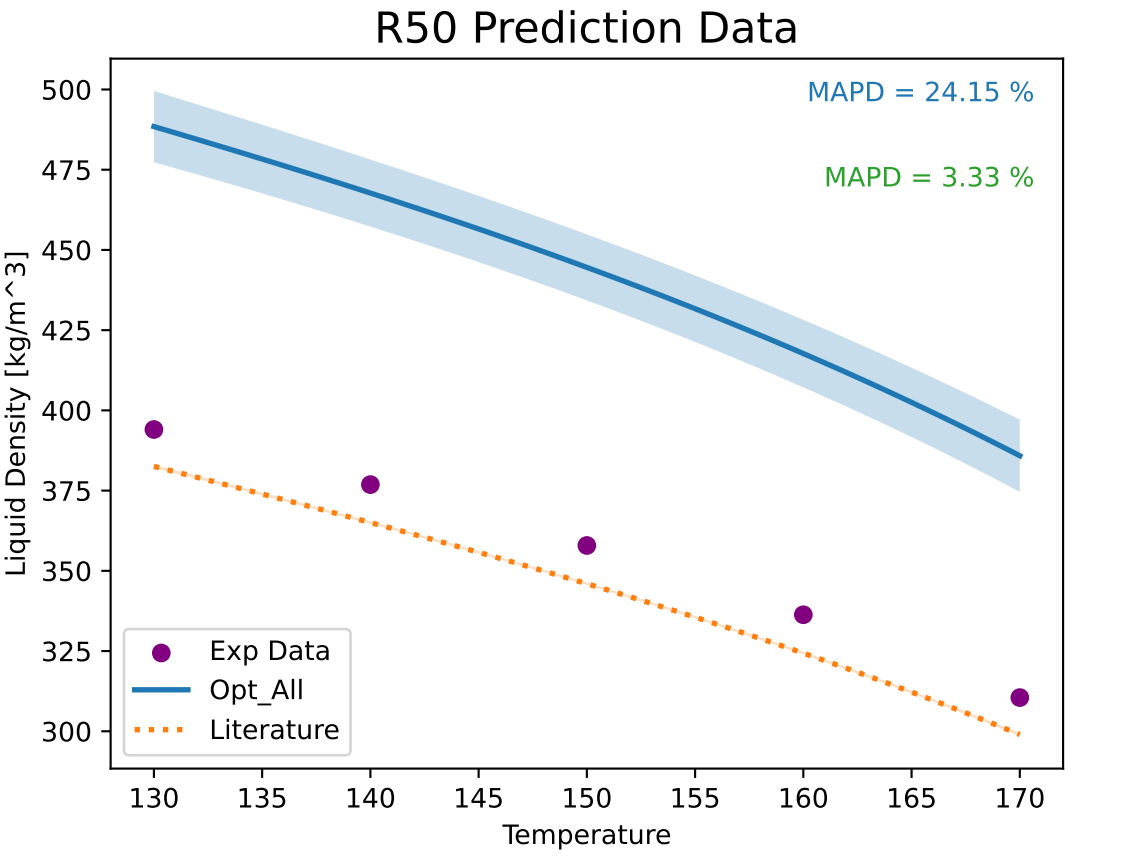

R14 Prediction Data
MAPD = 3.69 %
MAPD = 0.72 %
Enthalpy of Vaporization [kJ/kg]
Temperature
Exp Data
Opt_All
Literature
80
90
100
110
120
130
140
130
140
150
160
170
180
190
200
210

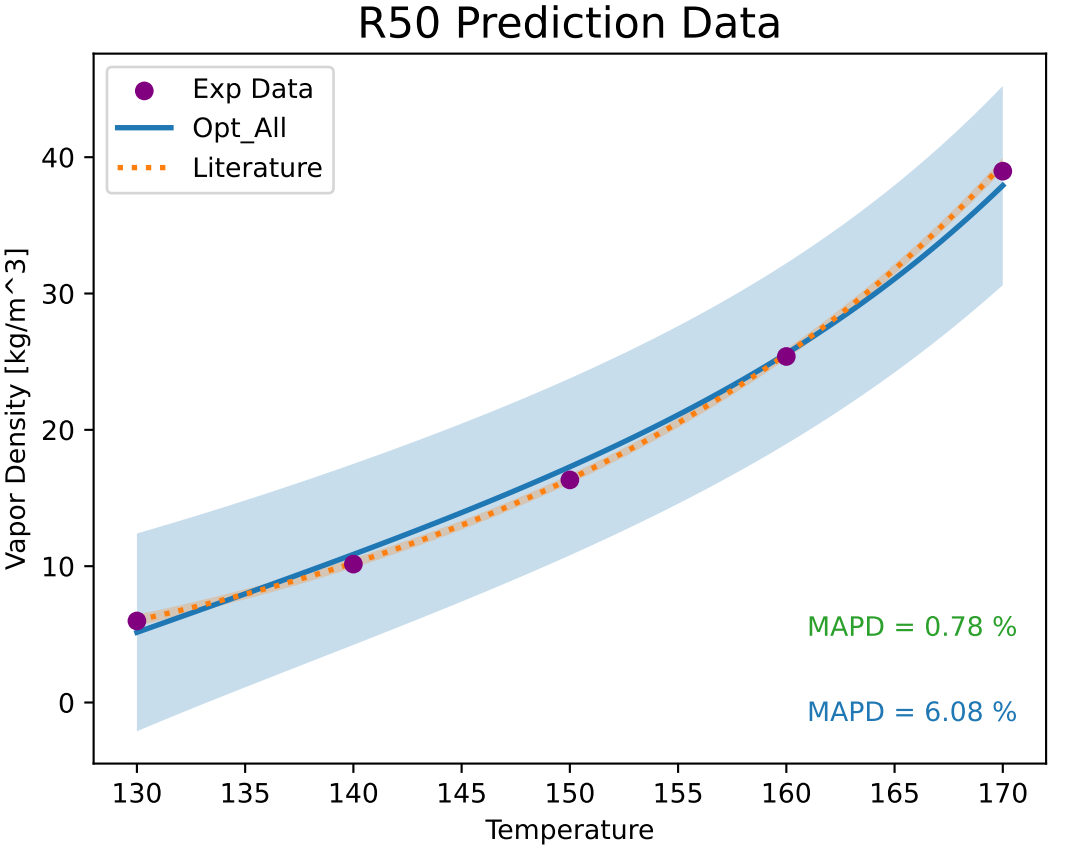

R32 Prediction Data
MAPD = 11.61 %
MAPD = 1.07 %
Liquid Density [kg/m^3]
1100
1000
900
800
700
240
250
260
270
280
290
300
310
320
Temperature
Exp Data
Opt_All
Literature

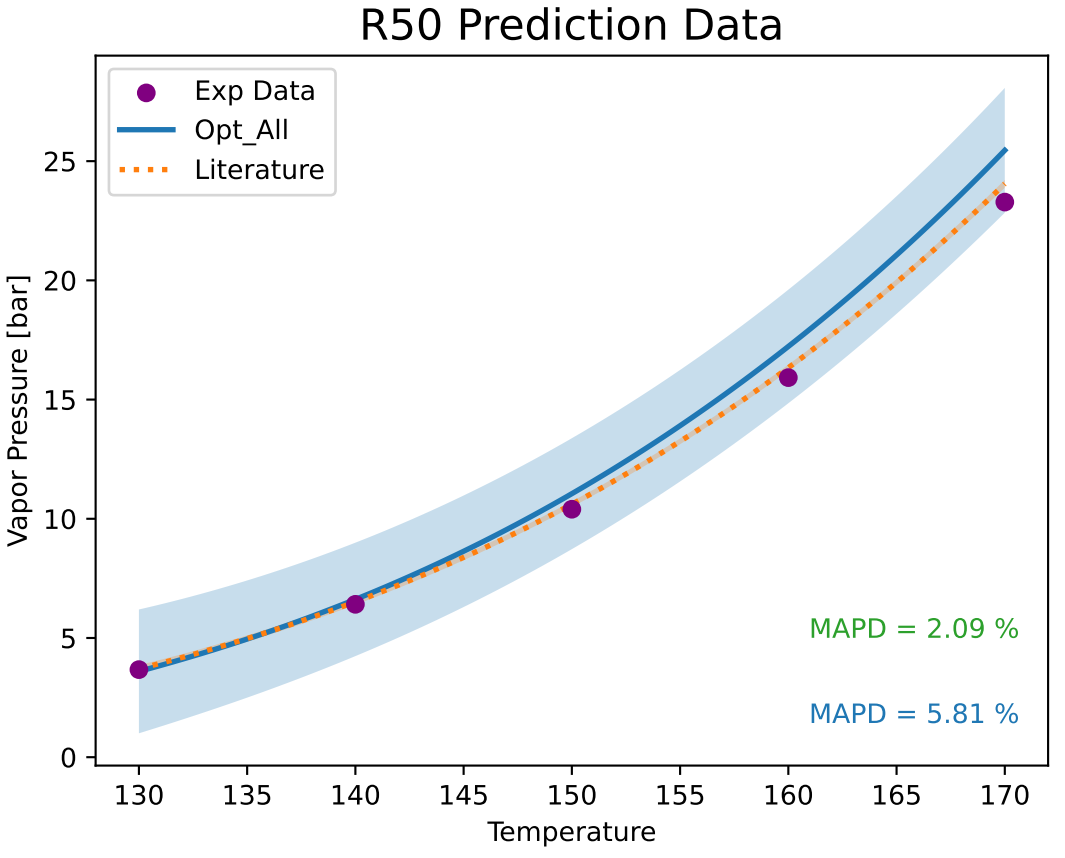

R32 Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
Temperature
0
25
50
75
100
125
150
175
240
250
260
270
280
290
300
310
320
MAPD = 2.03 %
MAPD = 123.10 %

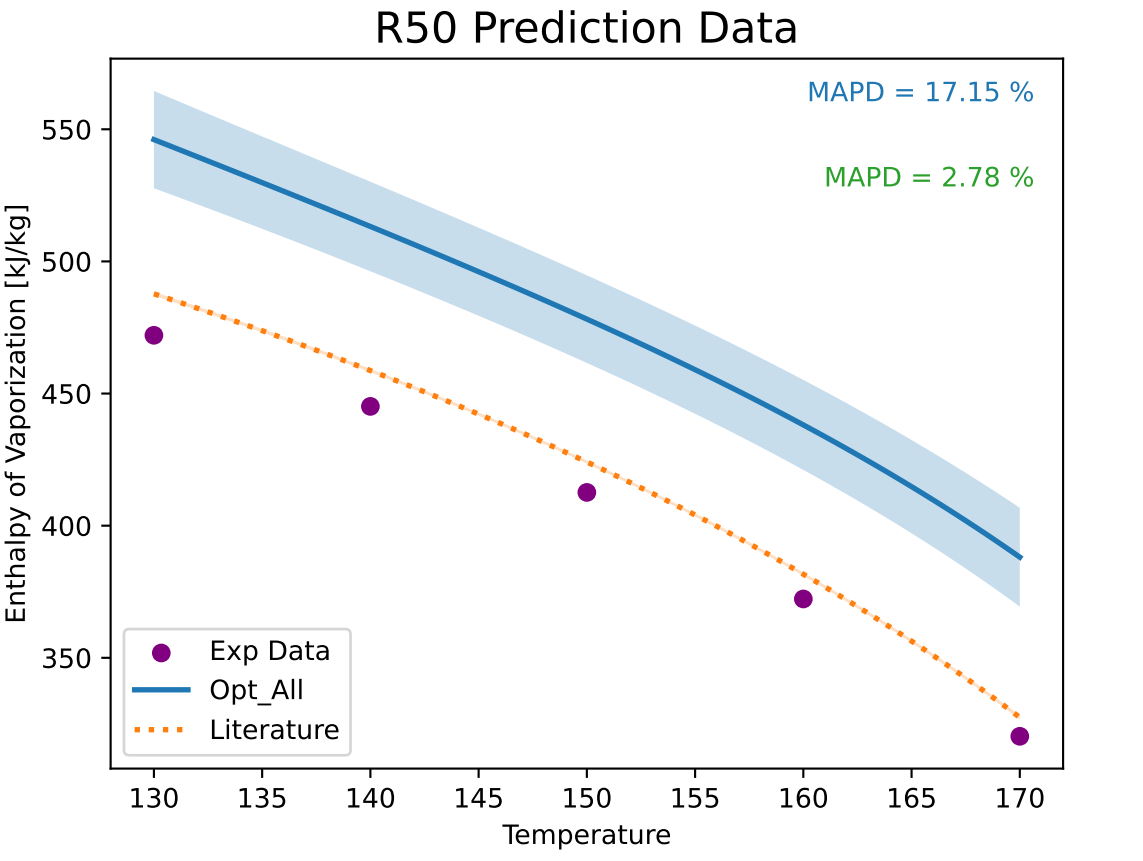

R32 Prediction Data
Exp Data
Opt_All
Literature
MAPD = 1.89 %
MAPD = 96.27 %
Vapor Pressure [bar]
Temperature
0
10
20
30
40
50
240
250
260
270
280
290
300
310
320

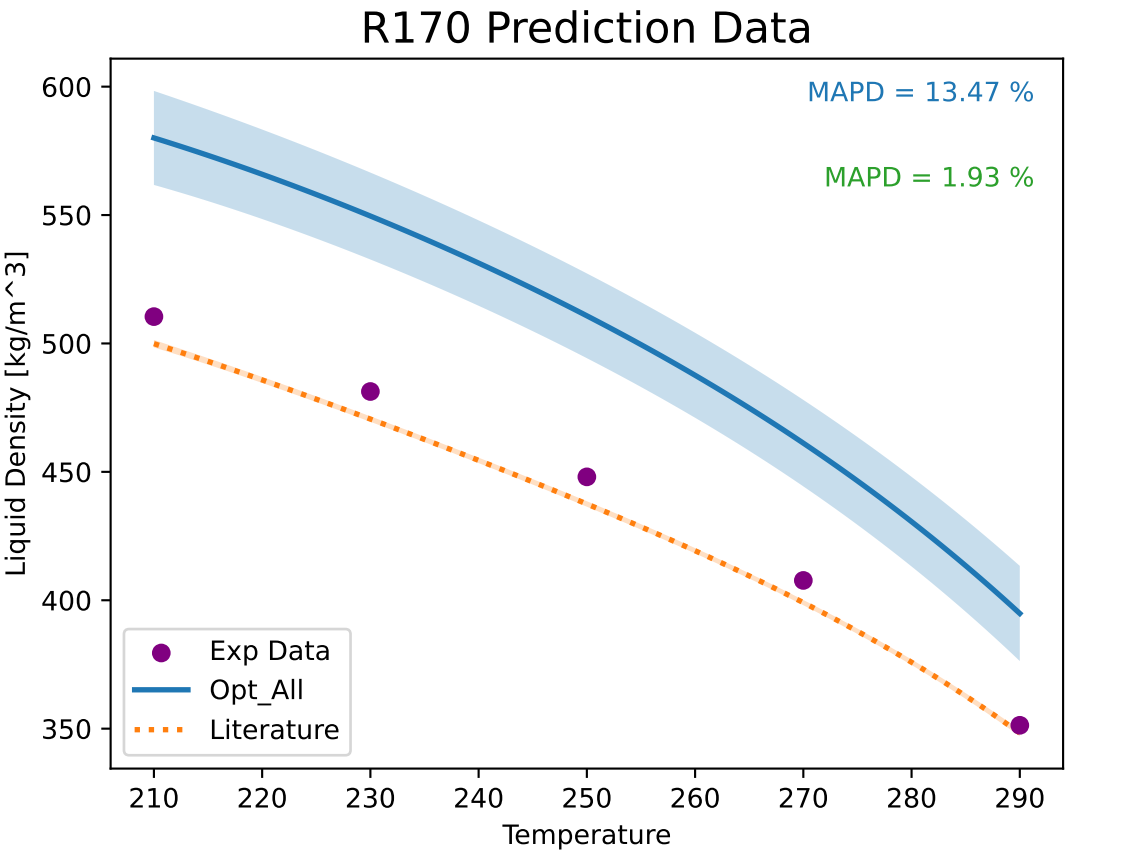

R32 Prediction Data
MAPD = 28.21 %
MAPD = 0.07 %
Enthalpy of Vaporization [kJ/kg]
Temperature
350
300
250
200
150
100
240
250
260
270
280
290
300
310
320
Exp Data
Opt_All
Literature

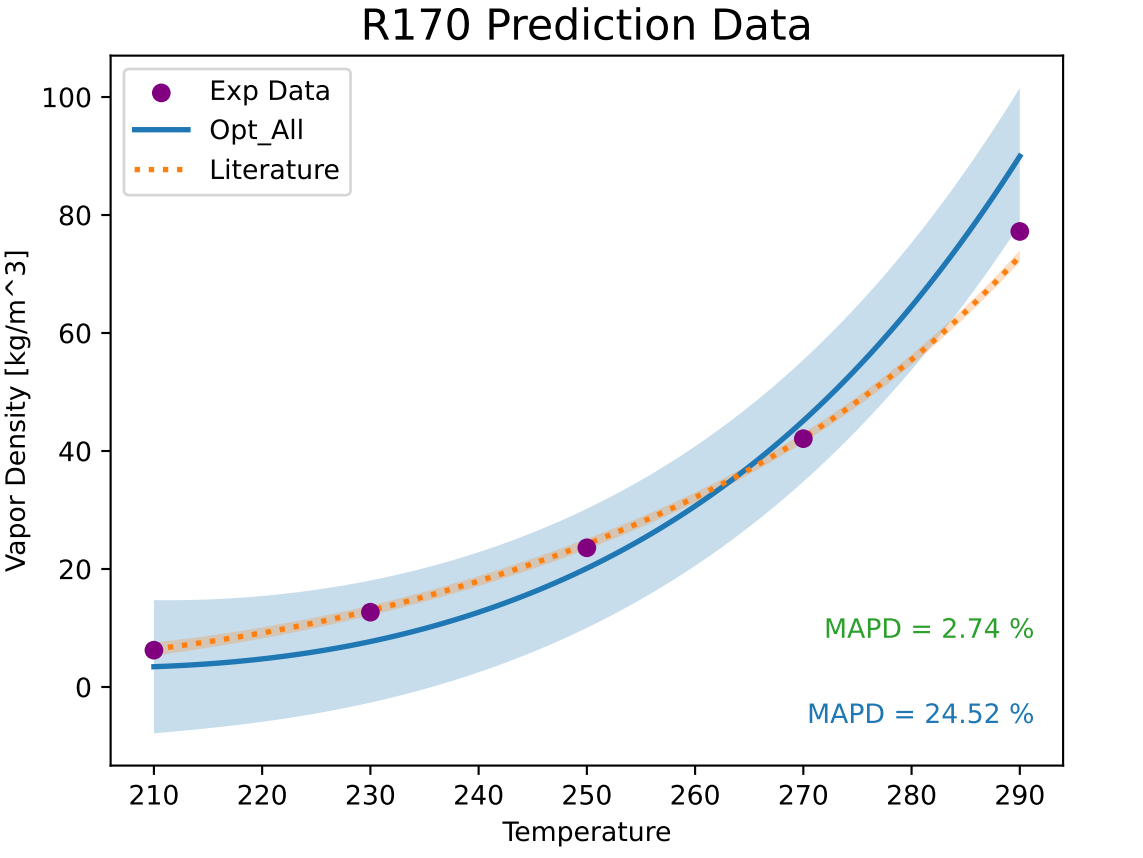

R50 Prediction Data
MAPD = 24.15 %
MAPD = 3.33 %
Liquid Density [kg/m^3]
Temperature
Exp Data
Opt_All
Literature
500
475
450
425
400
375
350
325
300
130
135
140
145
150
155
160
165
170

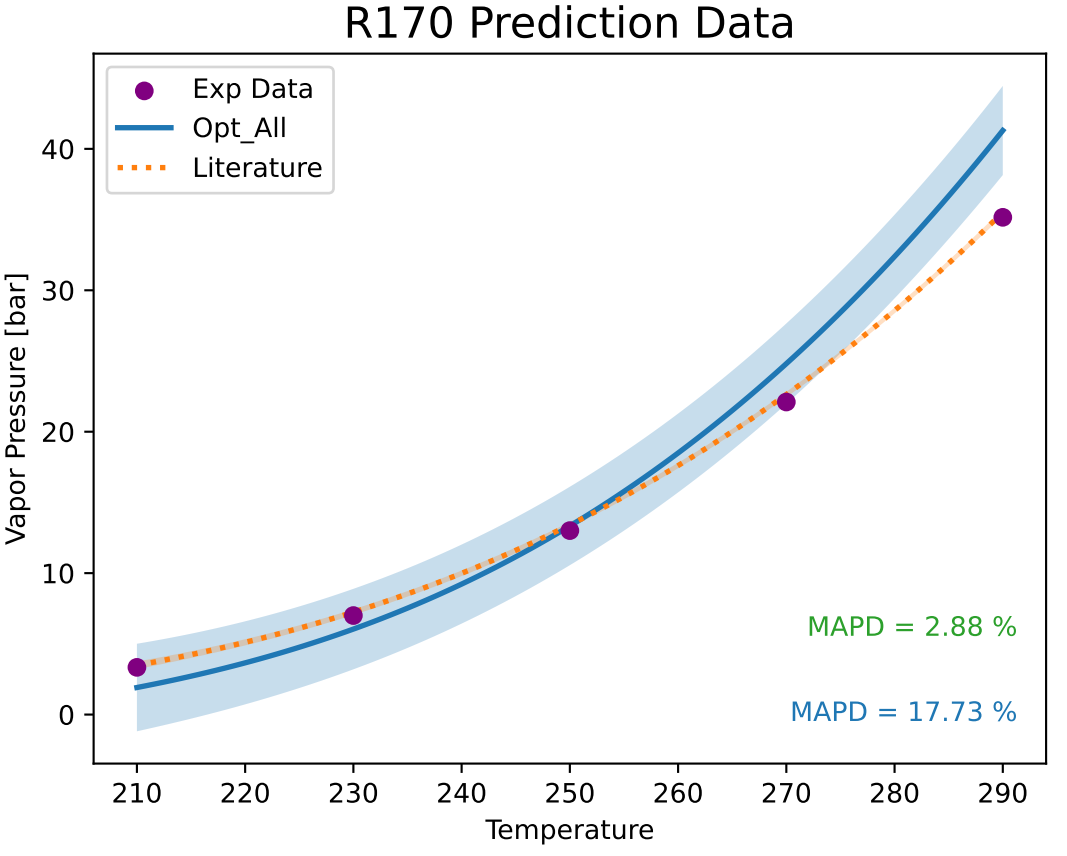

R50 Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
0
10
20
30
40
130
135
140
145
150
155
160
165
170
Temperature
MAPD = 0.78 %
MAPD = 6.08 %

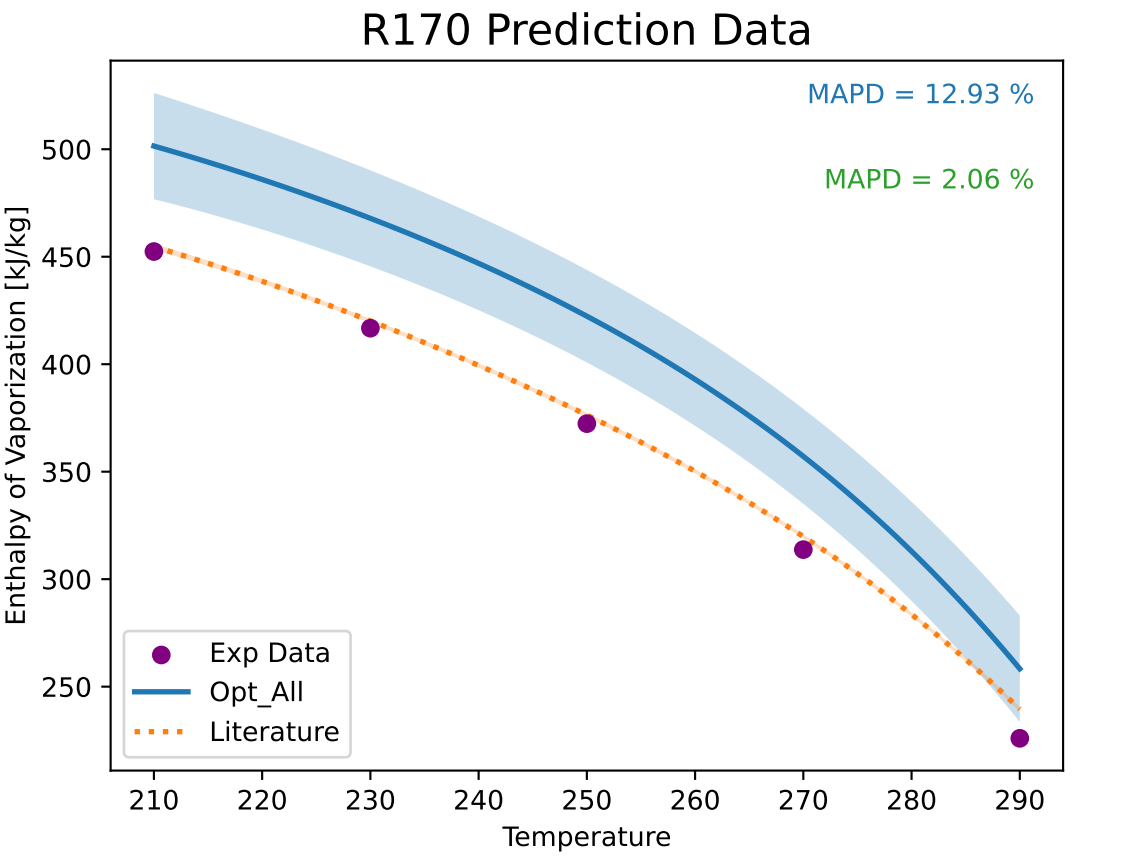

R50 Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
0
5
10
15
20
25
130
135
140
145
150
155
160
165
170
Temperature
MAPD = 2.09 %
MAPD = 5.81 %

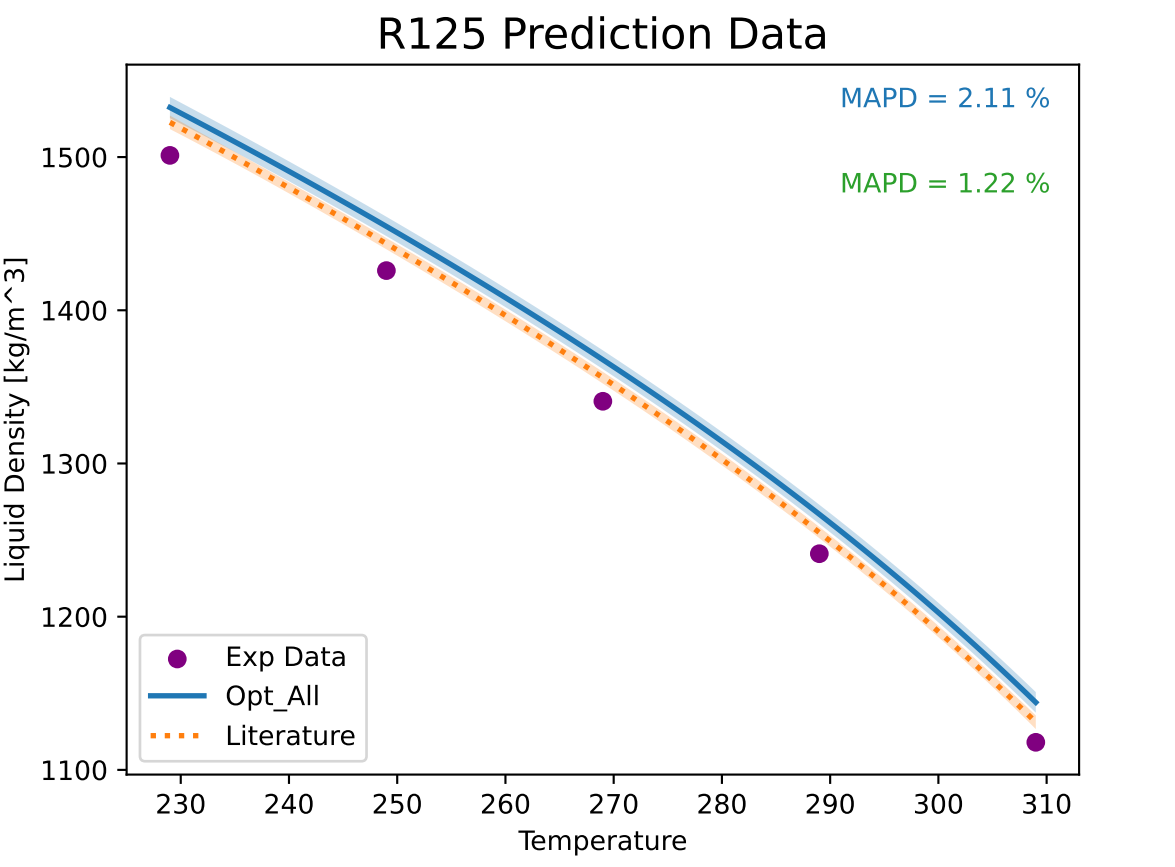

R50 Prediction Data
MAPD = 17.15 %
MAPD = 2.78 %
Enthalpy of Vaporization [kJ/kg]
550
500
450
400
350
Exp Data
Opt_All
Literature
130
135
140
145
150
155
160
165
170
Temperature

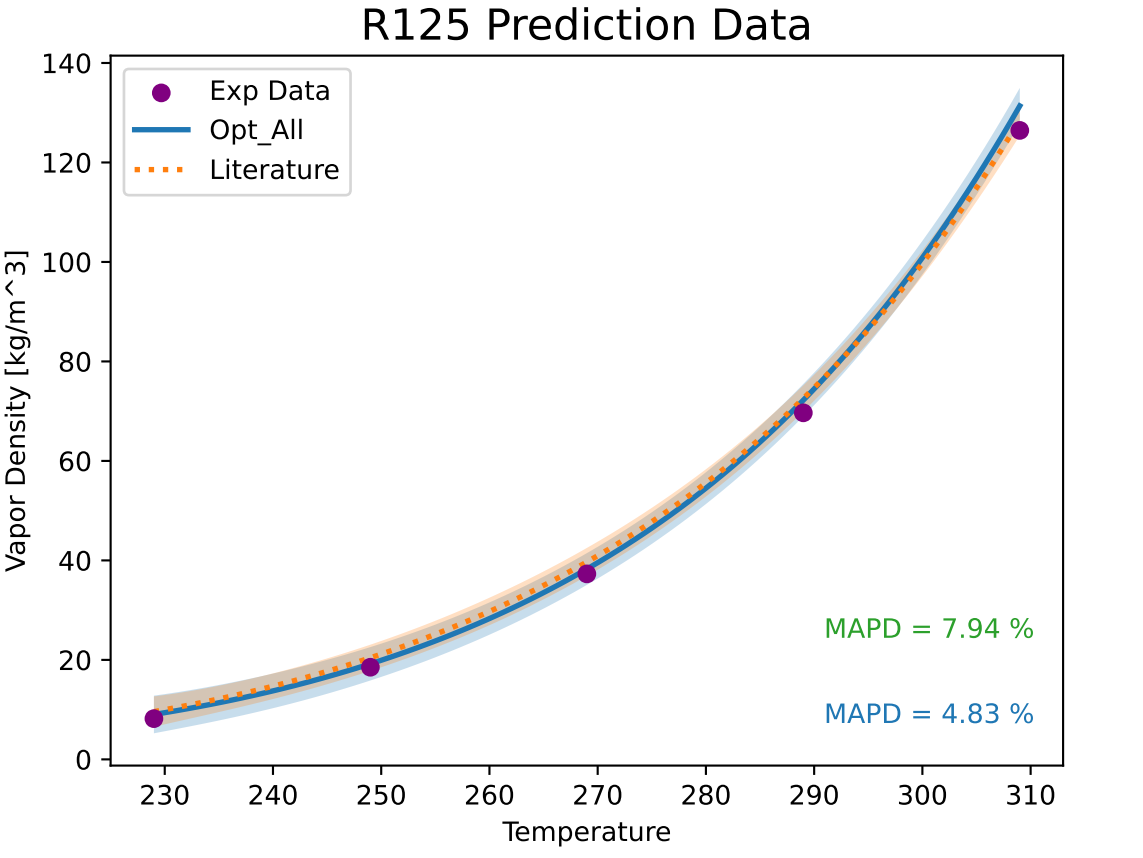

R170 Prediction Data
MAPD = 13.47 %
MAPD = 1.93 %
Exp Data
Opt_All
Literature
Liquid Density [kg/m^3]
Temperature
600
550
500
450
400
350
210
220
230
240
250
260
270
280
290

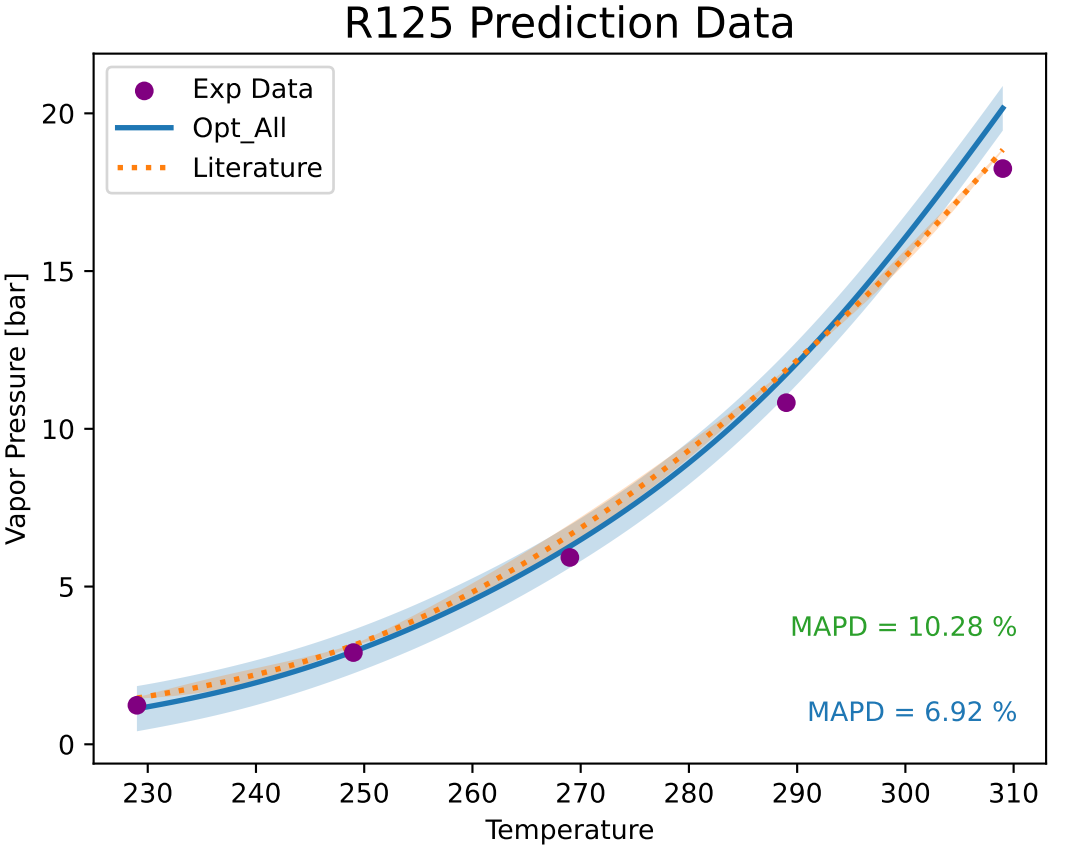

R170 Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 2.74 %
MAPD = 24.52 %
100
80
60
40
20
0
210
220
230
240
250
260
270
280
290

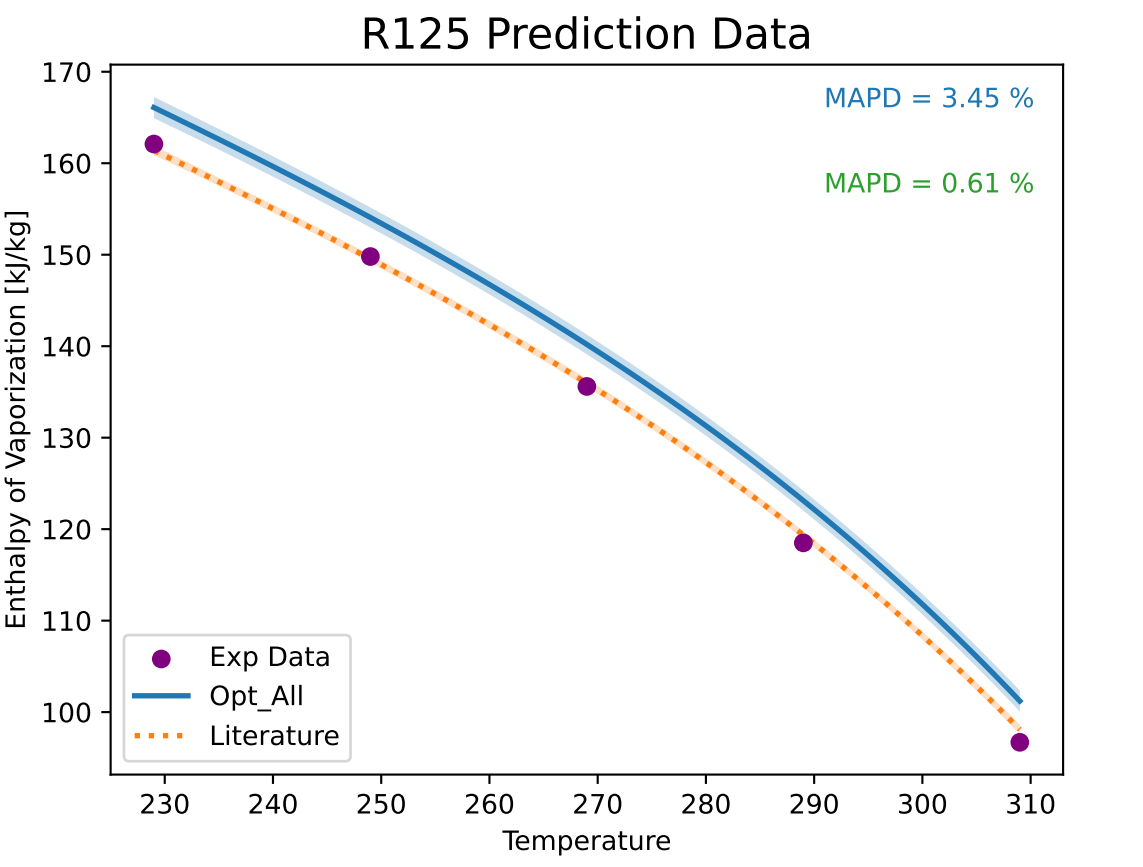

R170 Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
Temperature
0
10
20
30
40
210
220
230
240
250
260
270
280
290
MAPD = 2.88 %
MAPD = 17.73 %

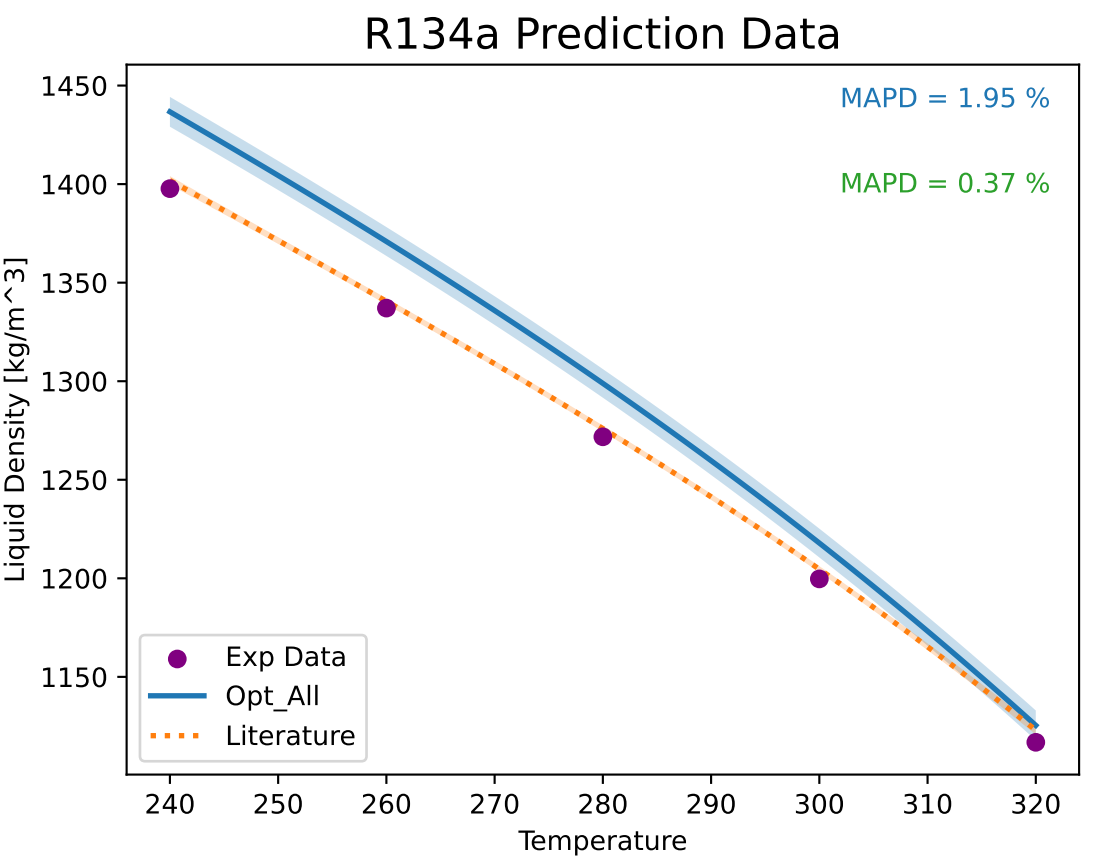

R170 Prediction Data
MAPD = 12.93 %
MAPD = 2.06 %
Enthalpy of Vaporization [kJ/kg]
Temperature
500
450
400
350
300
250
210
220
230
240
250
260
270
280
290
Exp Data
Opt_All
Literature

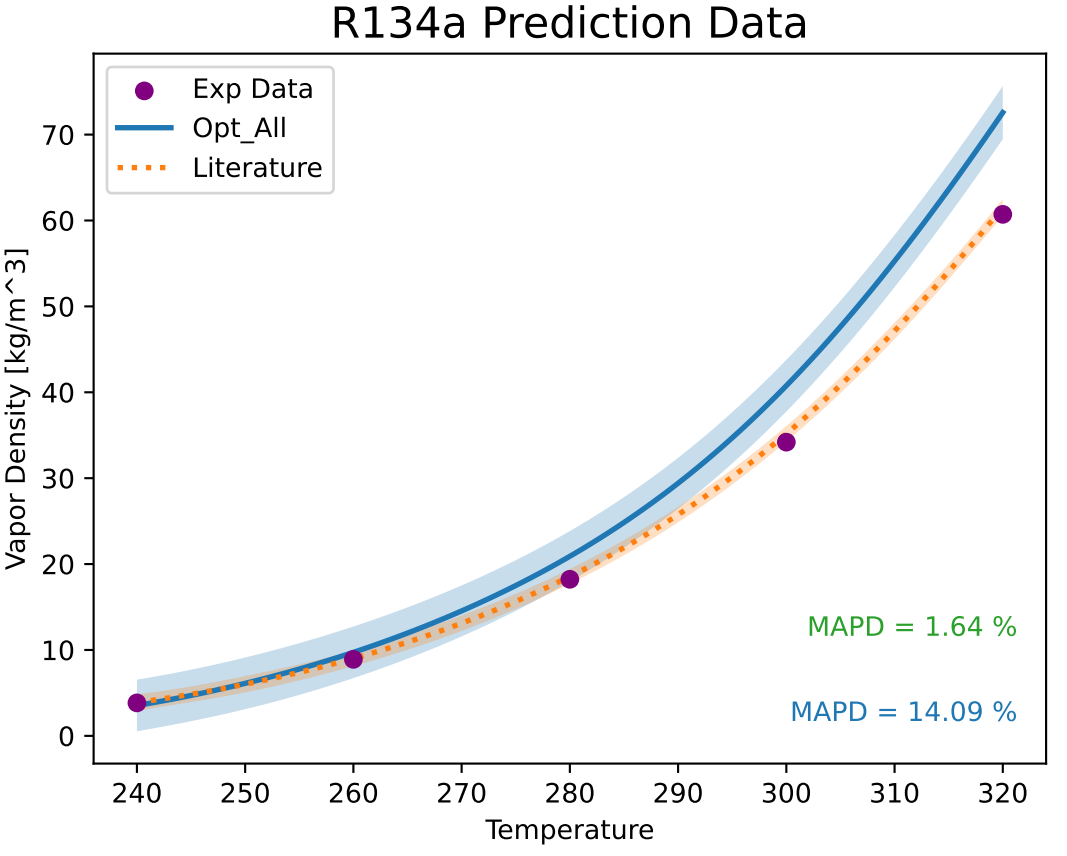

R125 Prediction Data
MAPD = 2.11 %
MAPD = 1.22 %
Liquid Density [kg/m^3]
1500
1400
1300
1200
1100
230
240
250
260
270
280
290
300
310
Temperature
Exp Data
Opt_All
Literature

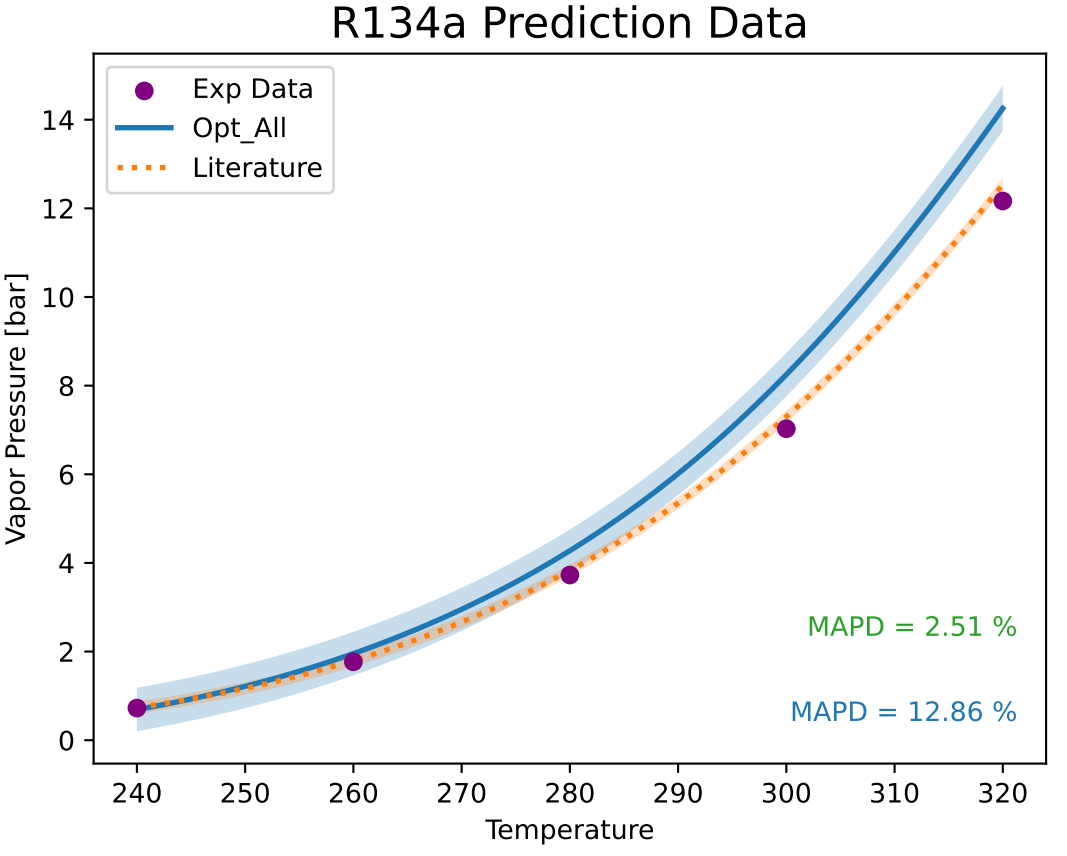

R125 Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 7.94 %
MAPD = 4.83 %
0
20
40
60
80
100
120
140
230
240
250
260
270
280
290
300
310

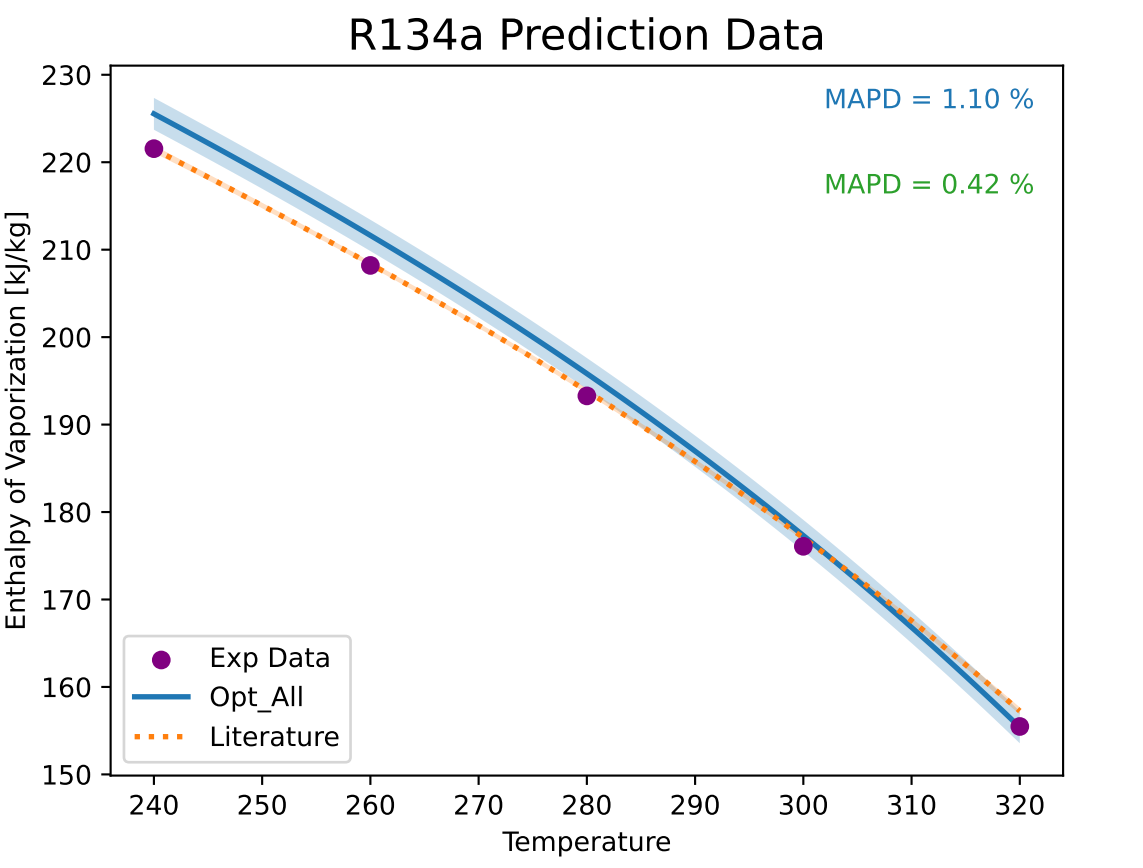

R125 Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
Temperature
0
5
10
15
20
230
240
250
260
270
280
290
300
310
MAPD = 10.28 %
MAPD = 6.92 %

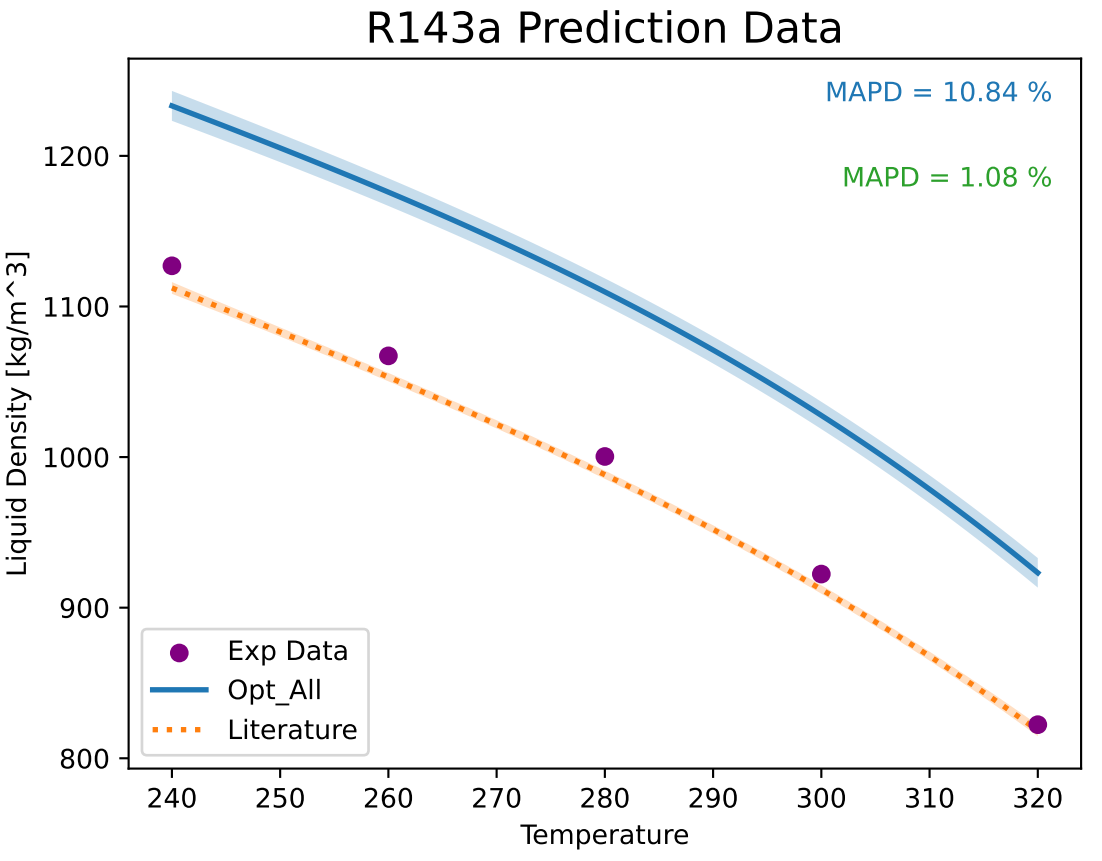

R125 Prediction Data
MAPD = 3.45 %
MAPD = 0.61 %
Exp Data
Opt_All
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
170
160
150
140
130
120
110
100
230
240
250
260
270
280
290
300
310

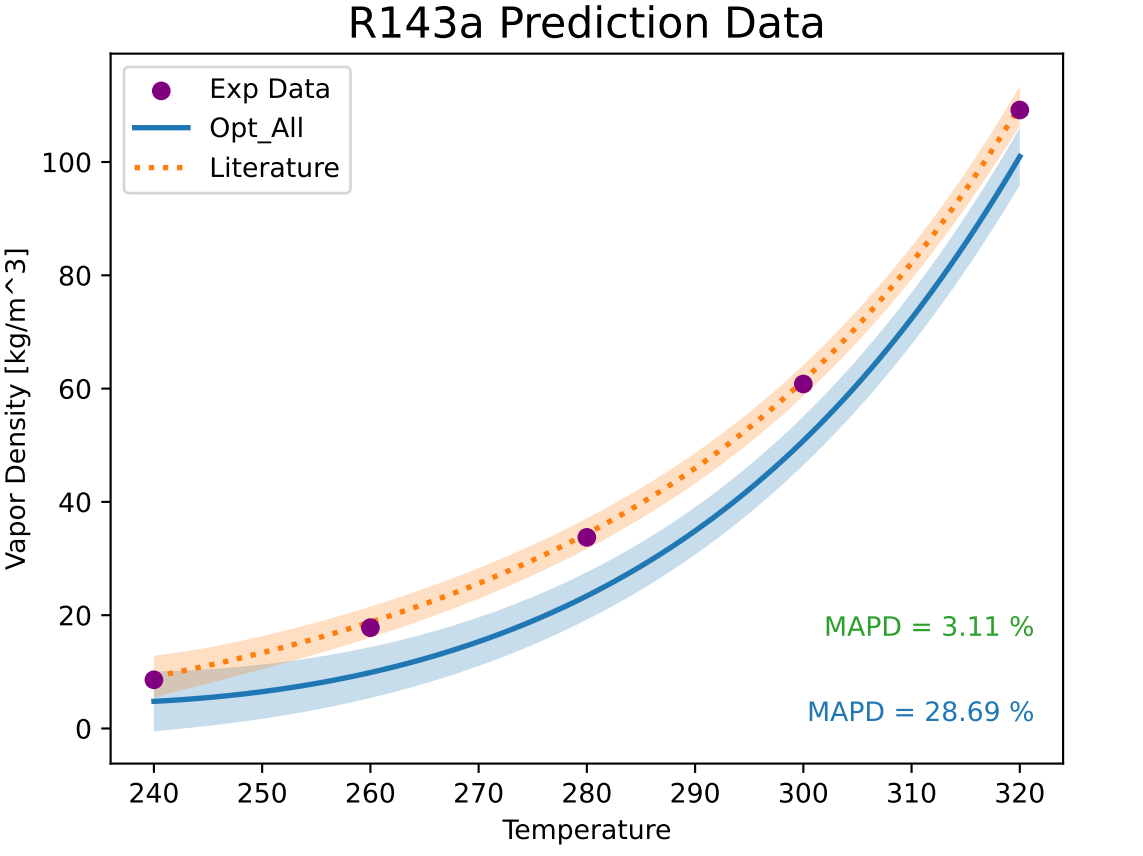

R134a Prediction Data
MAPD = 1.95 %
MAPD = 0.37 %
Liquid Density [kg/m^3]
Temperature
Exp Data
Opt_All
Literature
1450
1400
1350
1300
1250
1200
1150
240
250
260
270
280
290
300
310
320

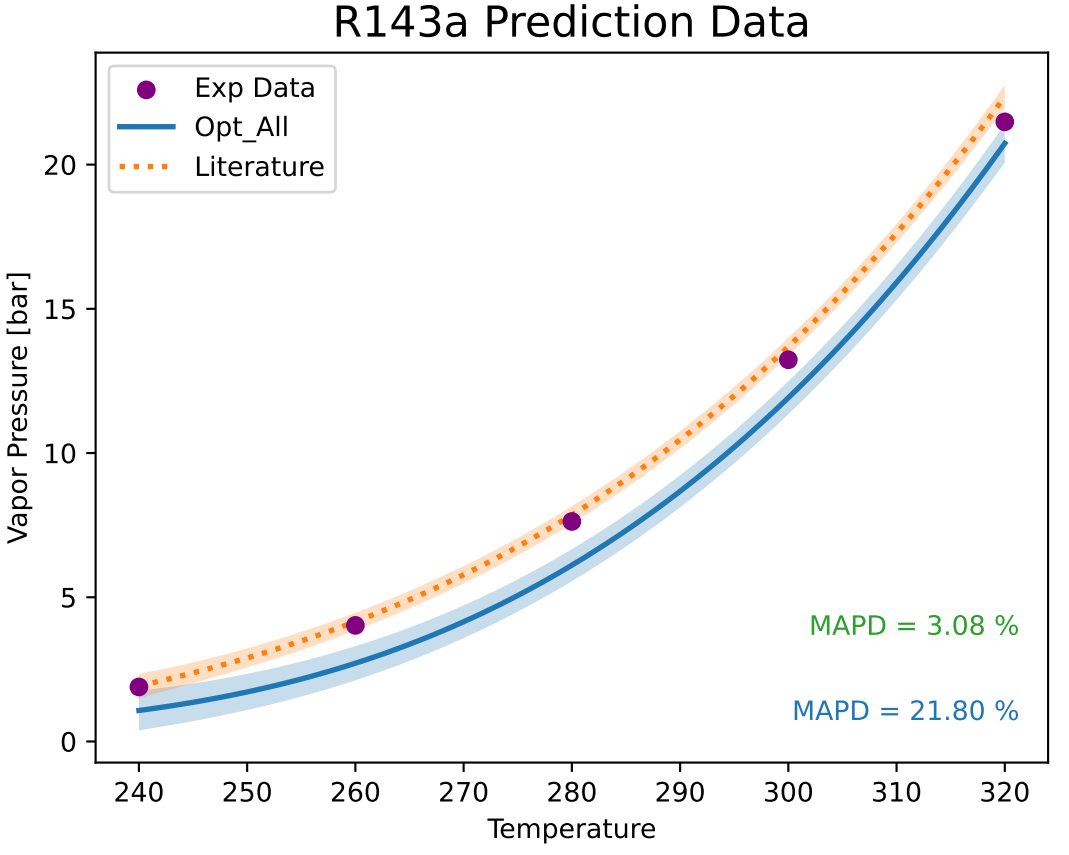

R134a Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 1.64 %
MAPD = 14.09 %
0
10
20
30
40
50
60
70
240
250
260
270
280
290
300
310
320

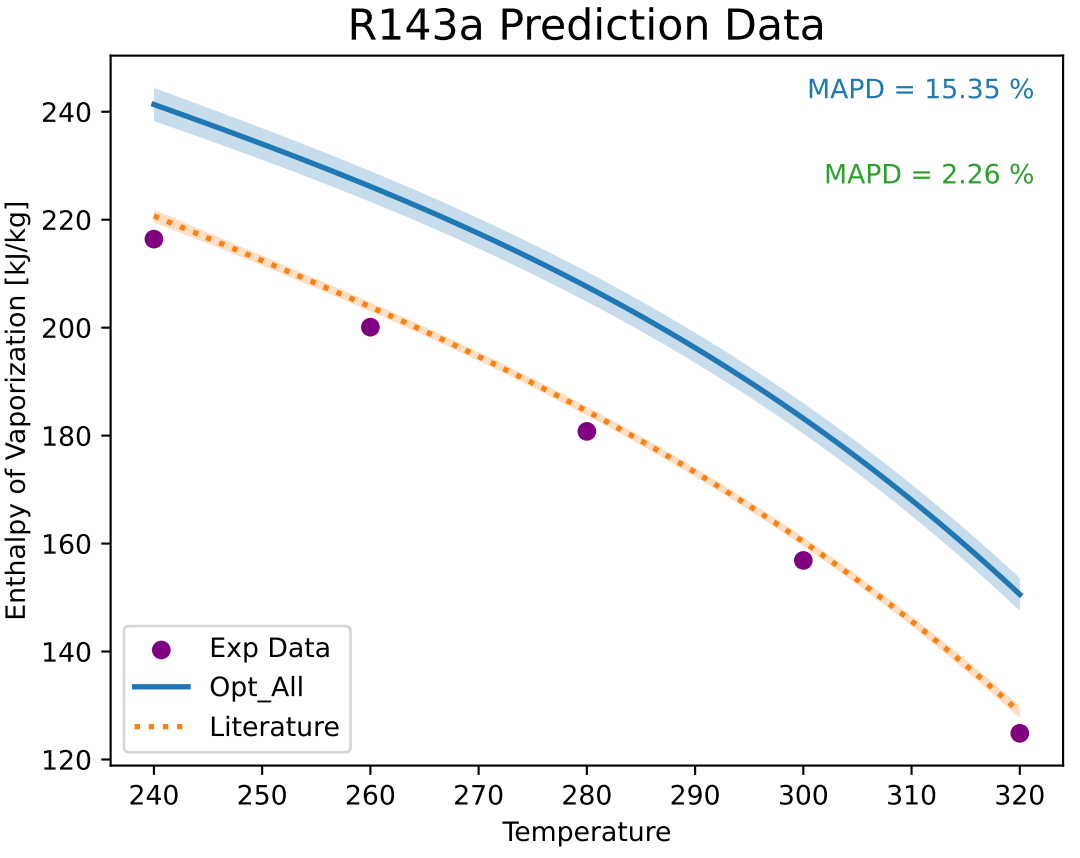

R134a Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
Temperature
0
2
4
6
8
10
12
14
240
250
260
270
280
290
300
310
320
MAPD = 2.51 %
MAPD = 12.86 %

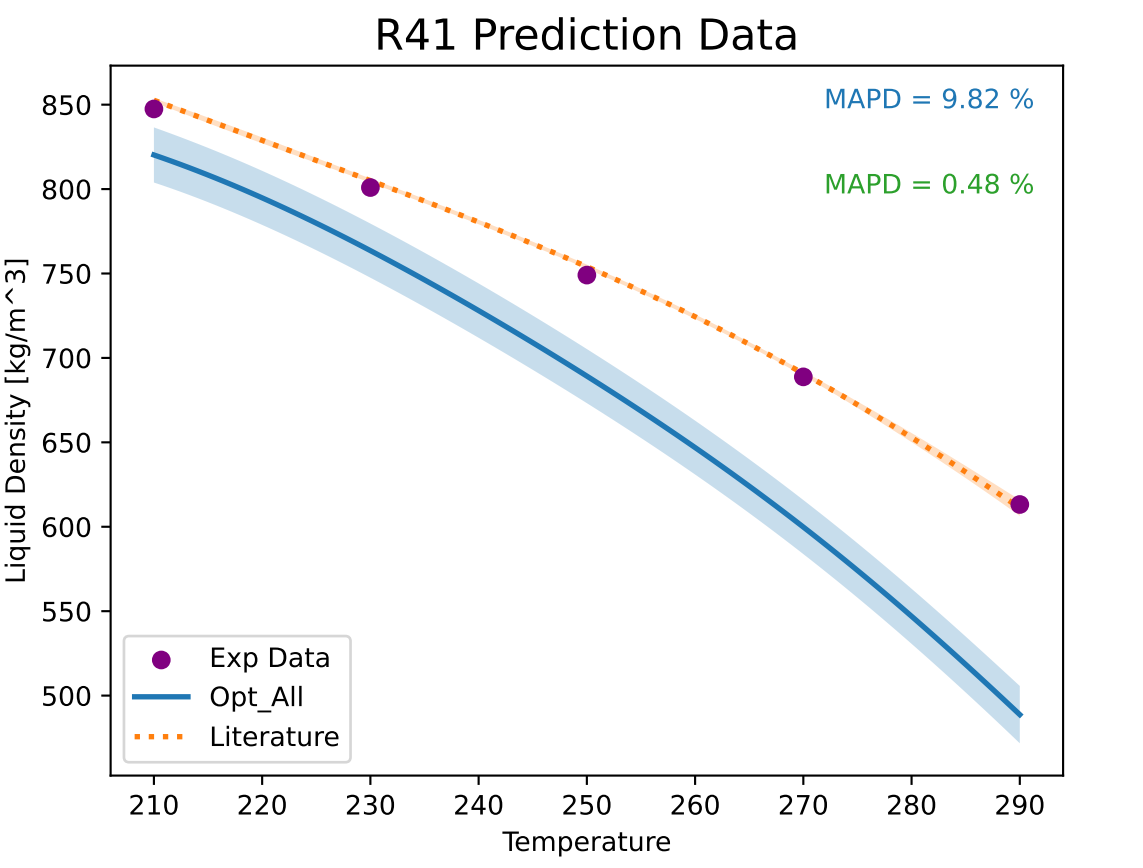

R134a Prediction Data
MAPD = 1.10 %
MAPD = 0.42 %
Enthalpy of Vaporization [kJ/kg]
Temperature
230
220
210
200
190
180
170
160
150
240
250
260
270
280
290
300
310
320
Exp Data
Opt_All
Literature

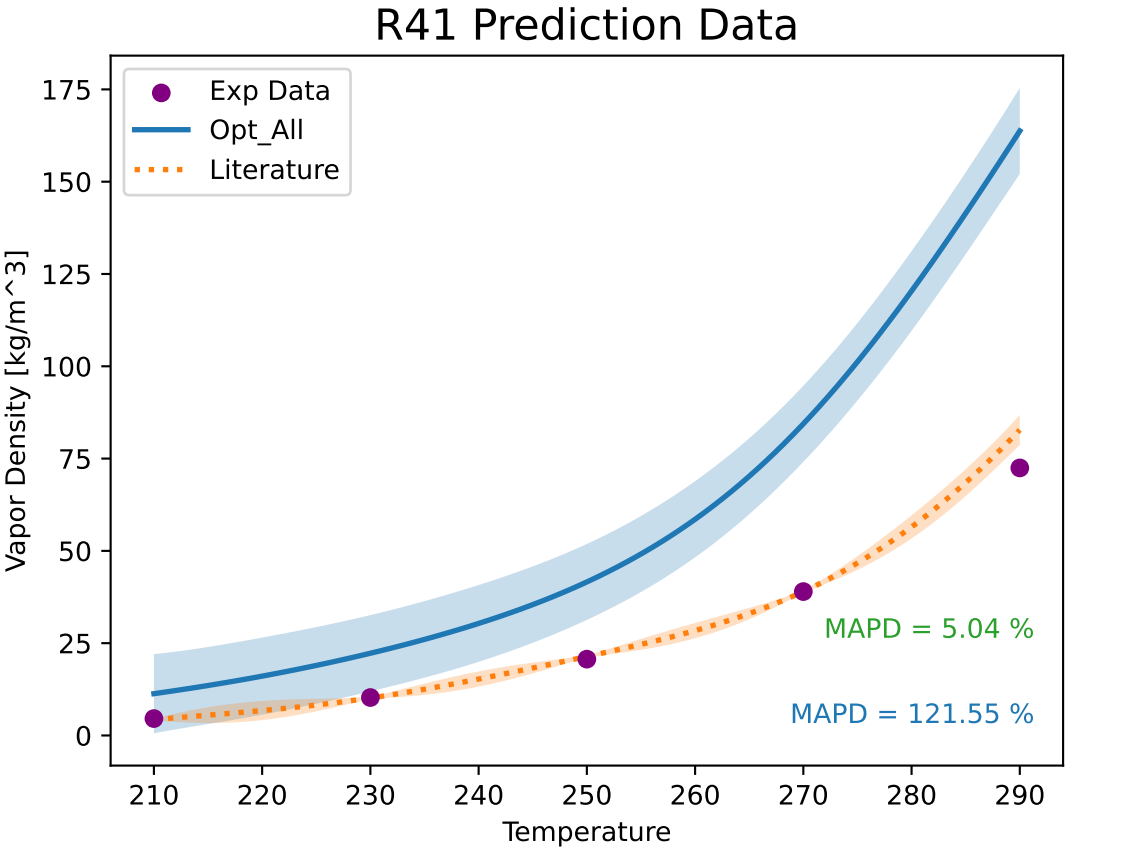

R143a Prediction Data
MAPD = 10.84 %
MAPD = 1.08 %
Liquid Density [kg/m^3]
1200
1100
1000
900
800
240
250
260
270
280
290
300
310
320
Temperature
Exp Data
Opt_All
Literature

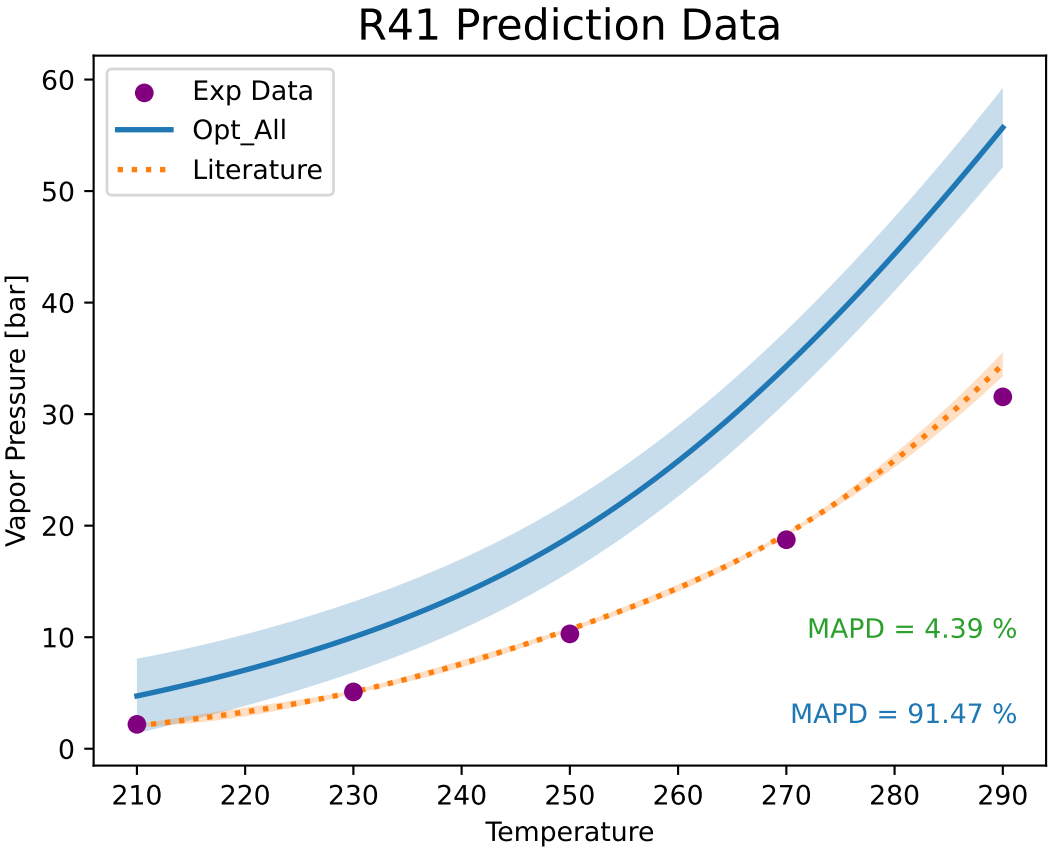

R143a Prediction Data
Exp Data
Opt_All
Literature
Vapor Density [kg/m^3]
0
20
40
60
80
100
240
250
260
270
280
290
300
310
320
Temperature
MAPD = 3.11 %
MAPD = 28.69 %

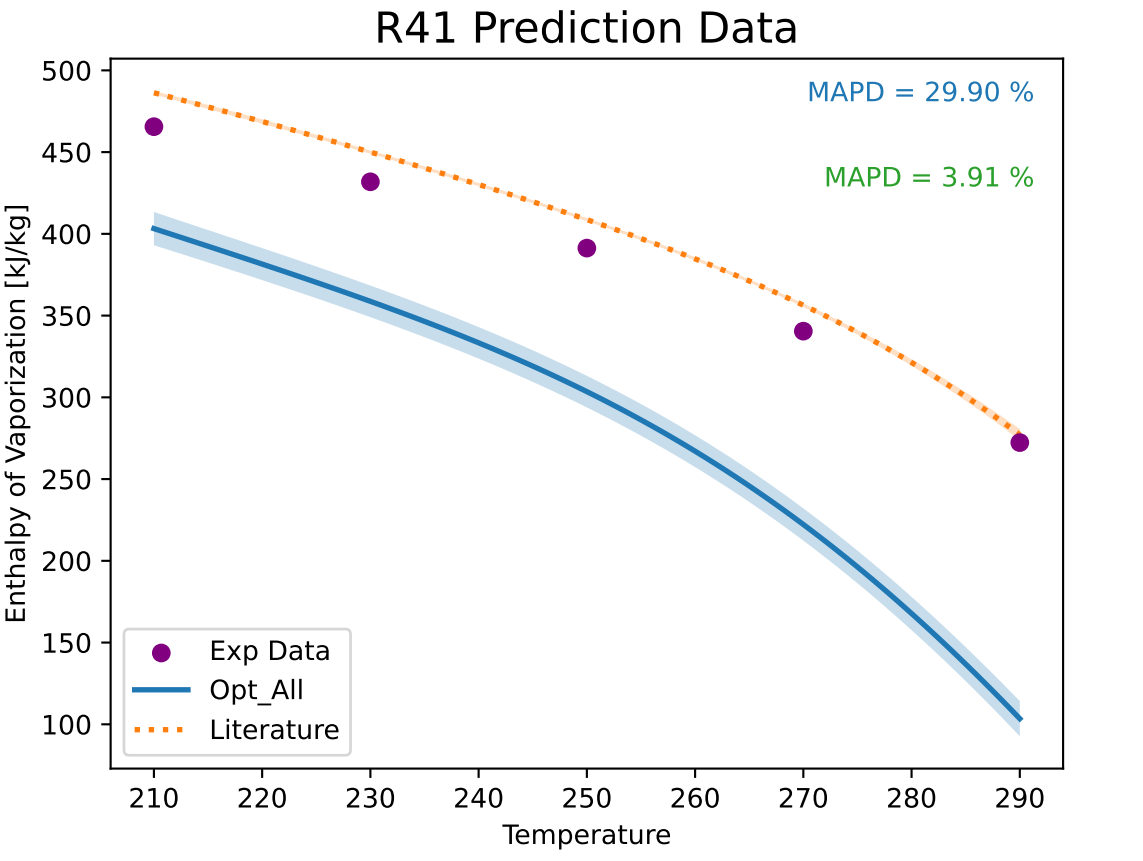

R143a Prediction Data
Exp Data
Opt_All
Literature
Vapor Pressure [bar]
0
5
10
15
20
240
250
260
270
280
290
300
310
320
Temperature
MAPD = 3.08 %
MAPD = 21.80 %


R143a Prediction Data
MAPD = 15.35 %
MAPD = 2.26 %
Enthalpy of Vaporization [kJ/kg]
Temperature
240
220
200
180
160
140
120
240
250
260
270
280
290
300
310
320
Exp Data
Opt_All
Literature


R41 Prediction Data
MAPD = 9.82 %
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 = 121.55 %
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
MAPD = 4.39 %
MAPD = 91.47 %
Vapor Pressure [bar]
Temperature
0
10
20
30
40
50
60
210
220
230
240
250
260
270
280
290


R41 Prediction Data
MAPD = 29.90 %
MAPD = 3.91 %
Exp Data
Opt_All
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
500
450
400
350
300
250
200
150
100
210
220
230
240
250
260
270
280
290