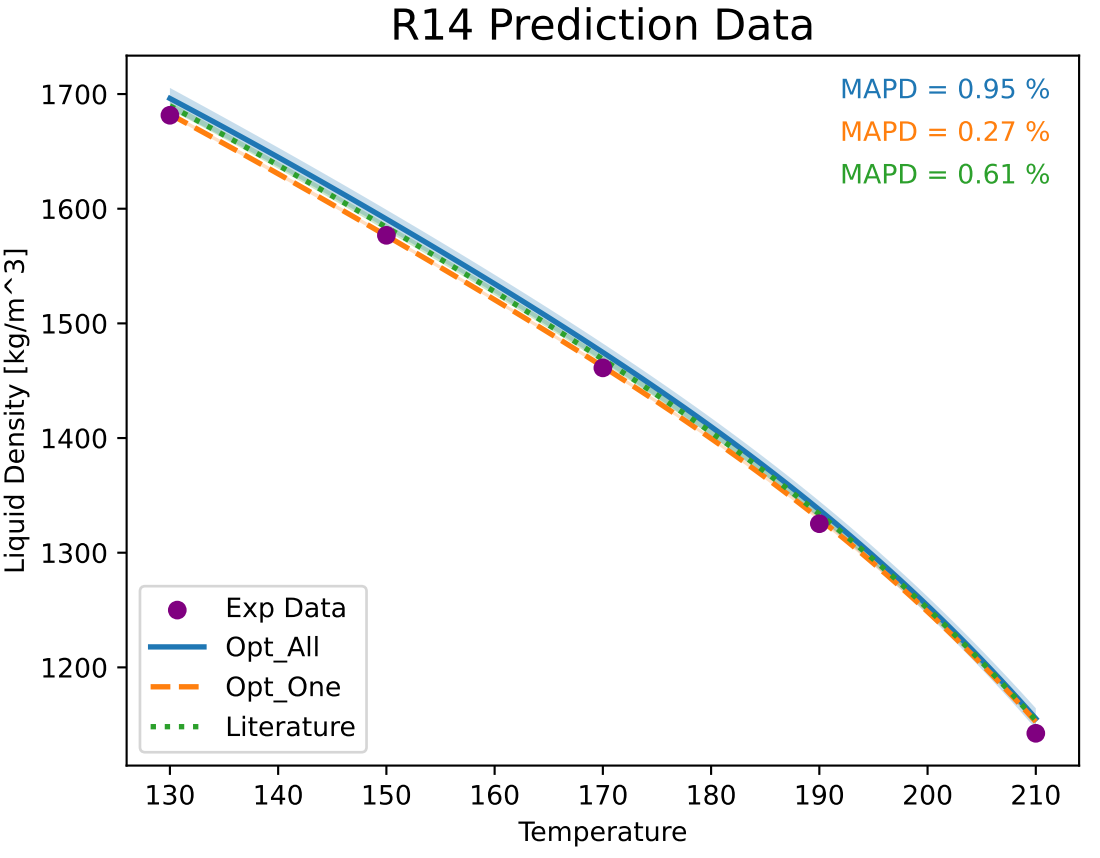
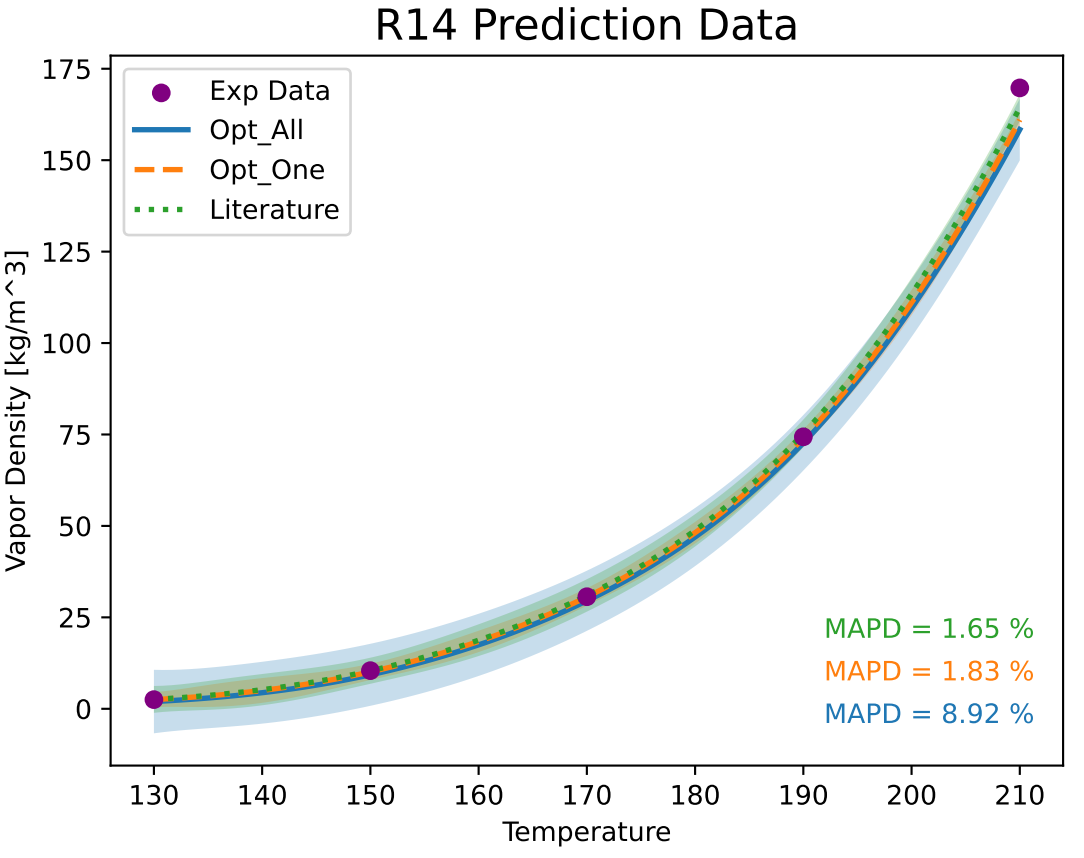
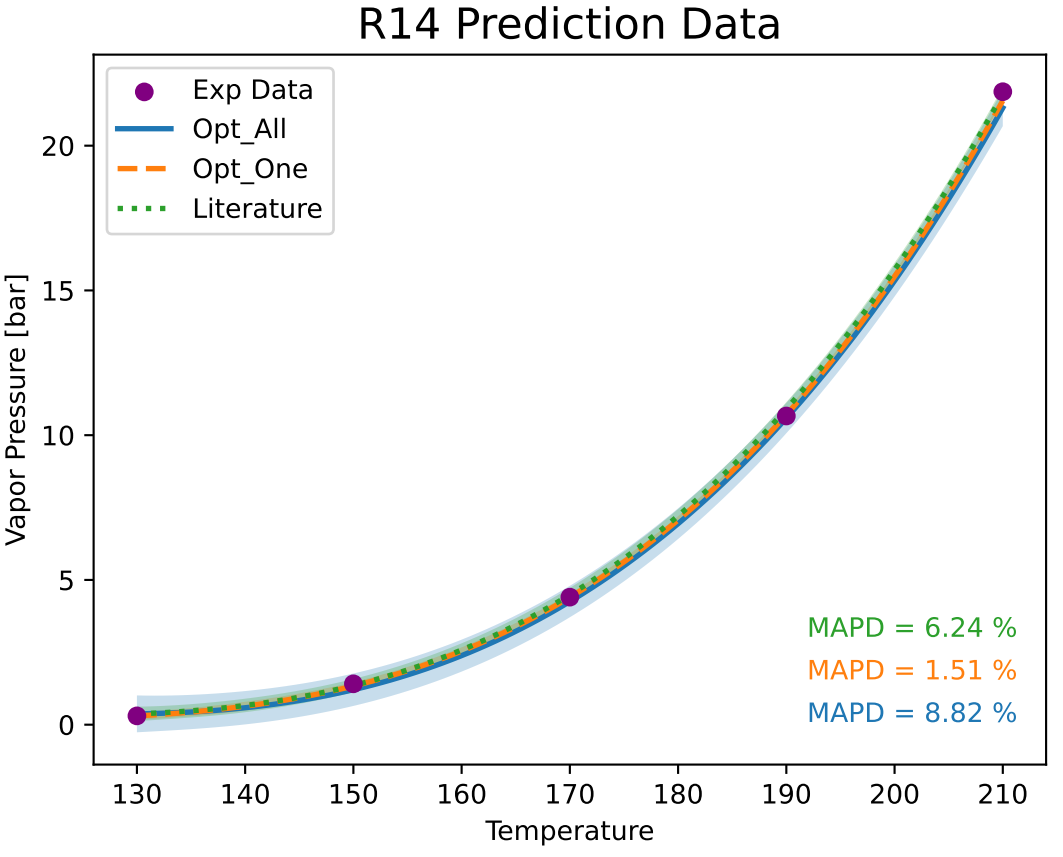
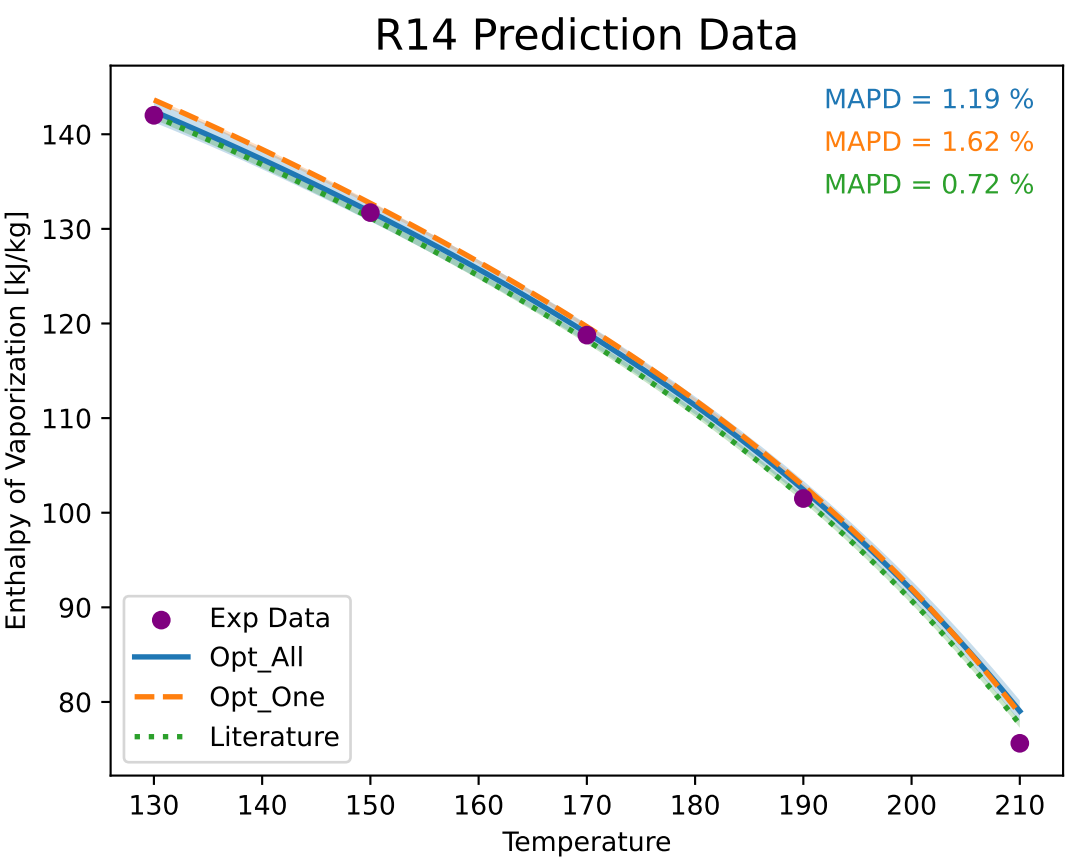
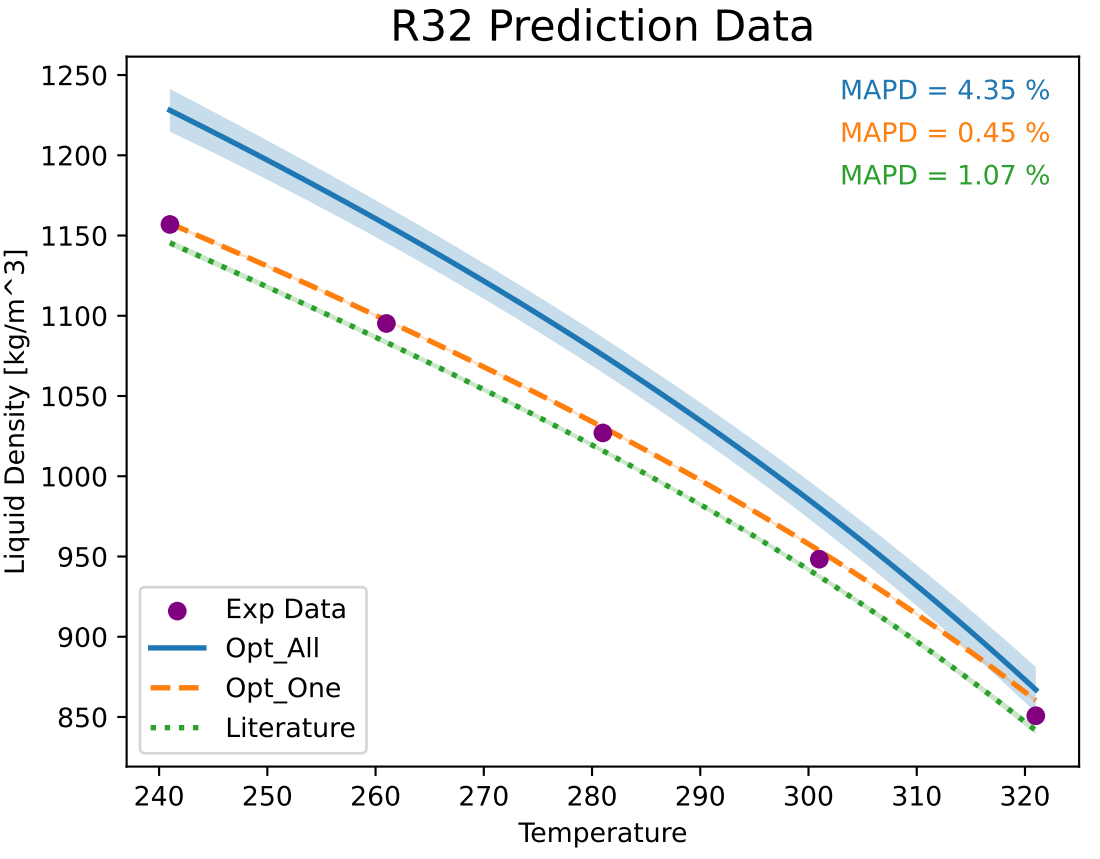
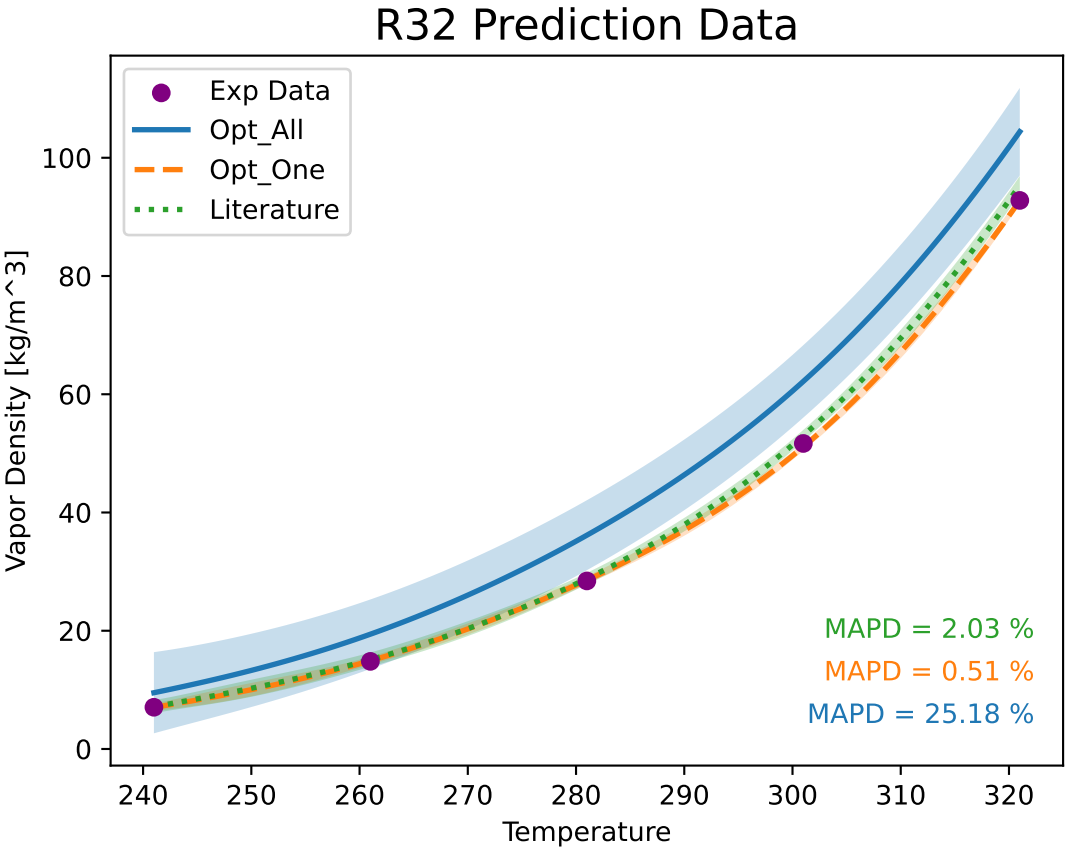

R14 Prediction Data
MAPD = 0.95 %
MAPD = 0.27 %
MAPD = 0.61 %
Exp Data
Opt_All
Opt_One
Literature
Liquid Density [kg/m^3]
Temperature
1700
1600
1500
1400
1300
1200
130
140
150
160
170
180
190
200
210

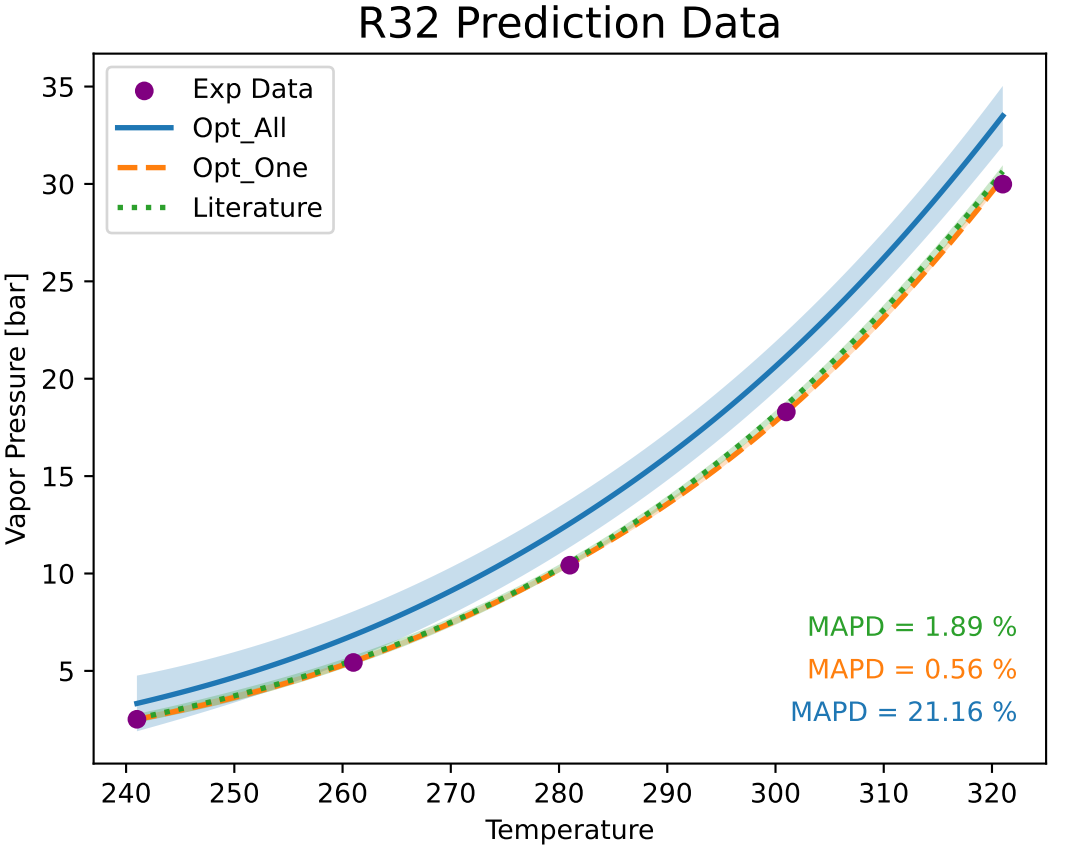

R14 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 1.65 %
MAPD = 1.83 %
MAPD = 8.92 %
175
150
125
100
75
50
25
0
130
140
150
160
170
180
190
200
210

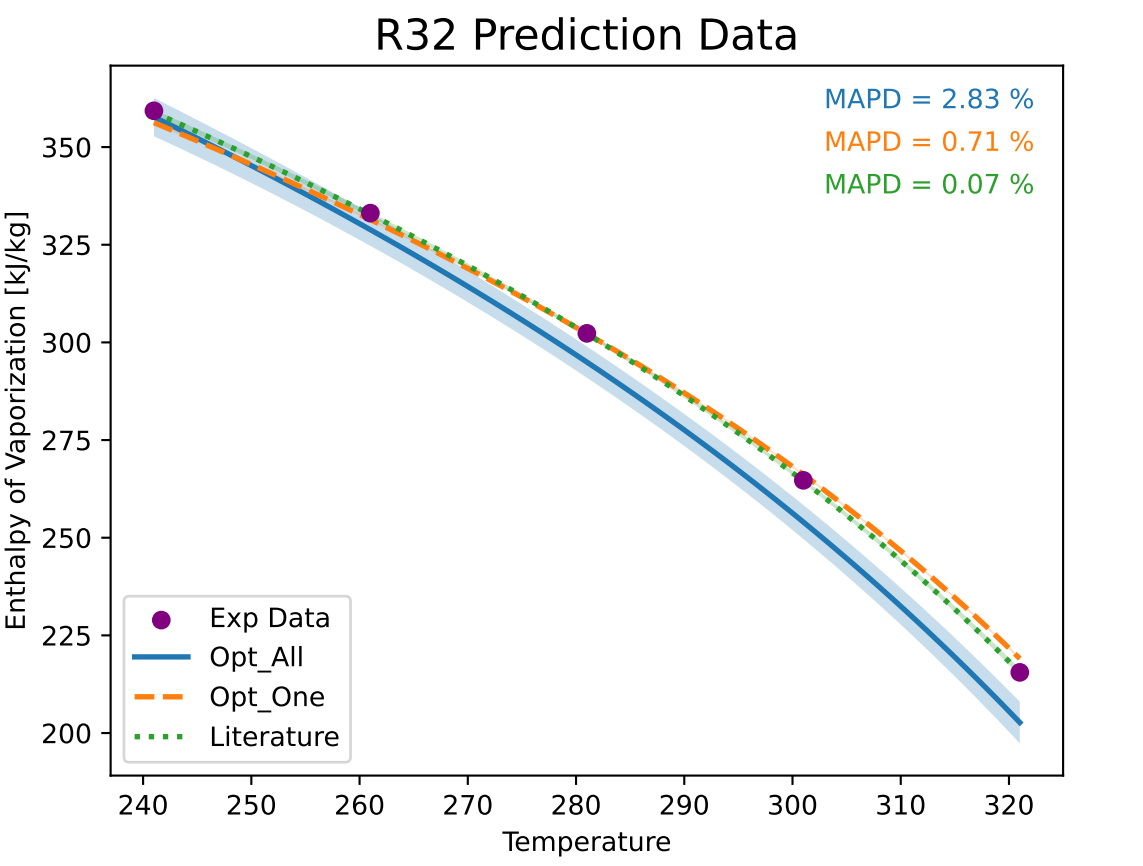

R14 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
0
5
10
15
20
130
140
150
160
170
180
190
200
210
Temperature
MAPD = 6.24 %
MAPD = 1.51 %
MAPD = 8.82 %

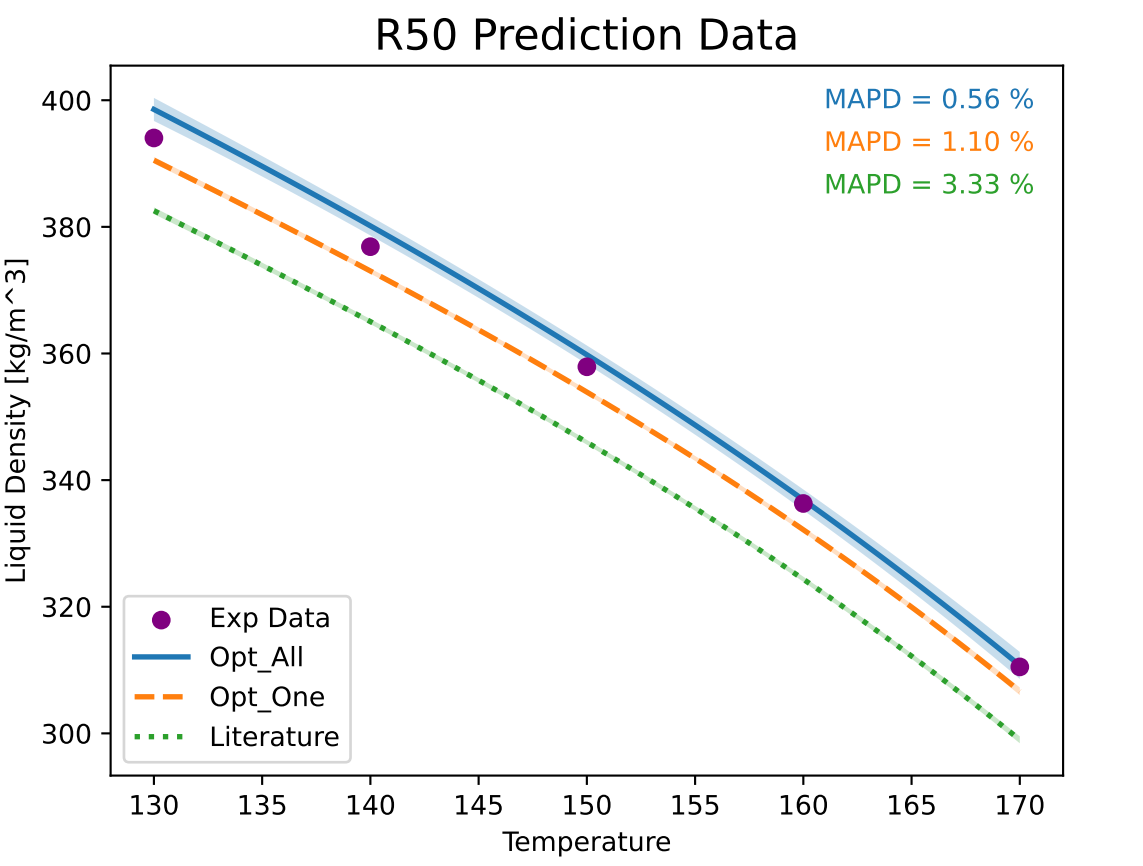

R14 Prediction Data
MAPD = 1.19 %
MAPD = 1.62 %
MAPD = 0.72 %
Exp Data
Opt_All
Opt_One
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
140
130
120
110
100
90
80
130
140
150
160
170
180
190
200
210

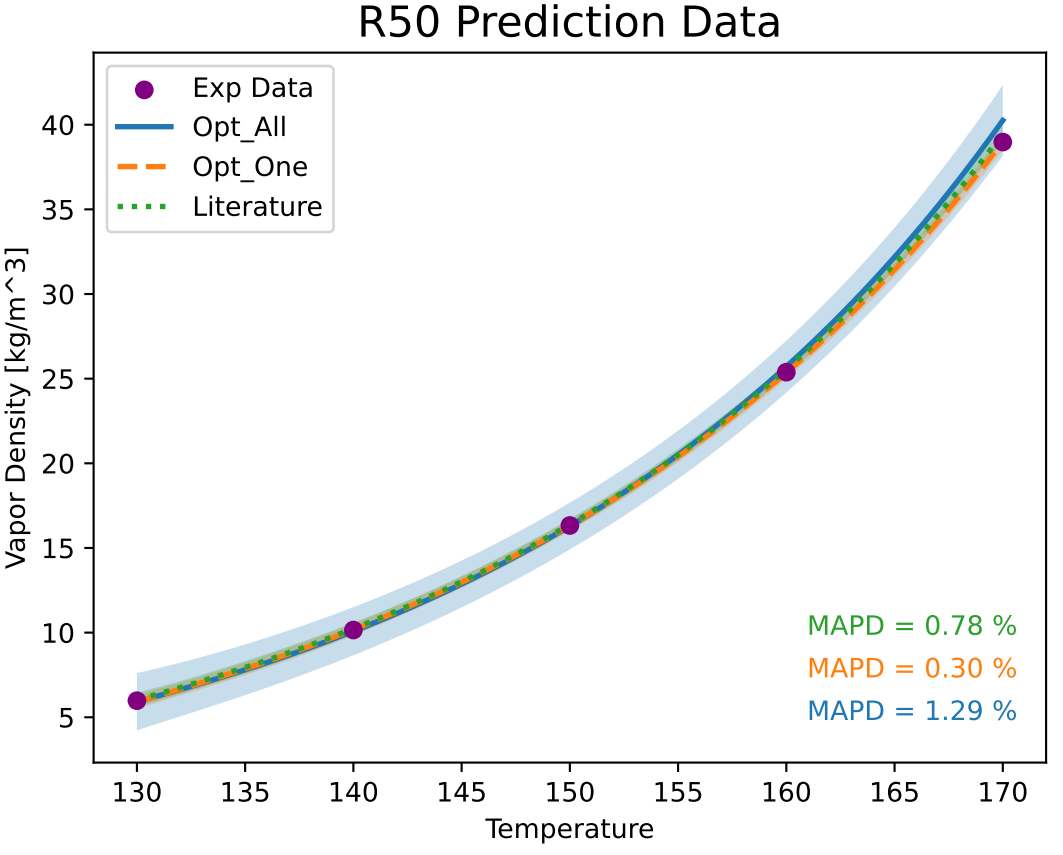

R32 Prediction Data
MAPD = 4.35 %
MAPD = 0.45 %
MAPD = 1.07 %
Liquid Density [kg/m^3]
Temperature
Exp Data
Opt_All
Opt_One
Literature
1250
1200
1150
1100
1050
1000
950
900
850
240
250
260
270
280
290
300
310
320

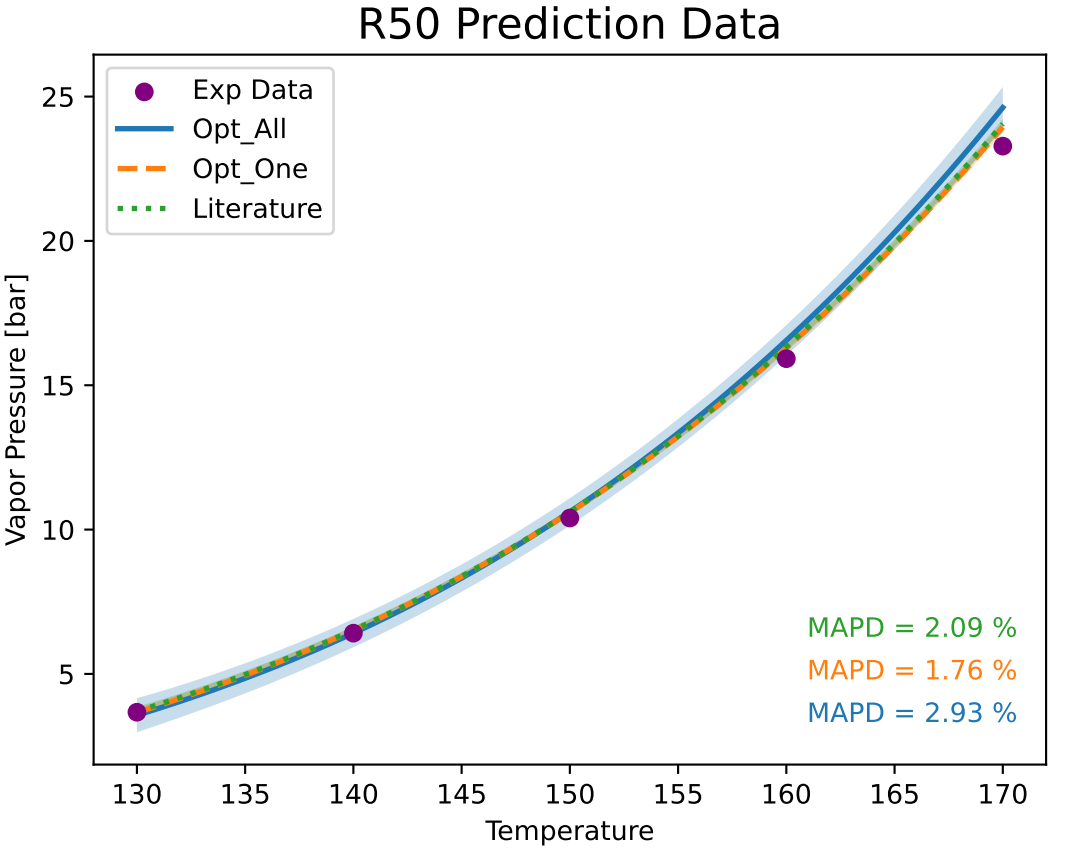

R32 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
0
20
40
60
80
100
240
250
260
270
280
290
300
310
320
Temperature
MAPD = 2.03 %
MAPD = 0.51 %
MAPD = 25.18 %

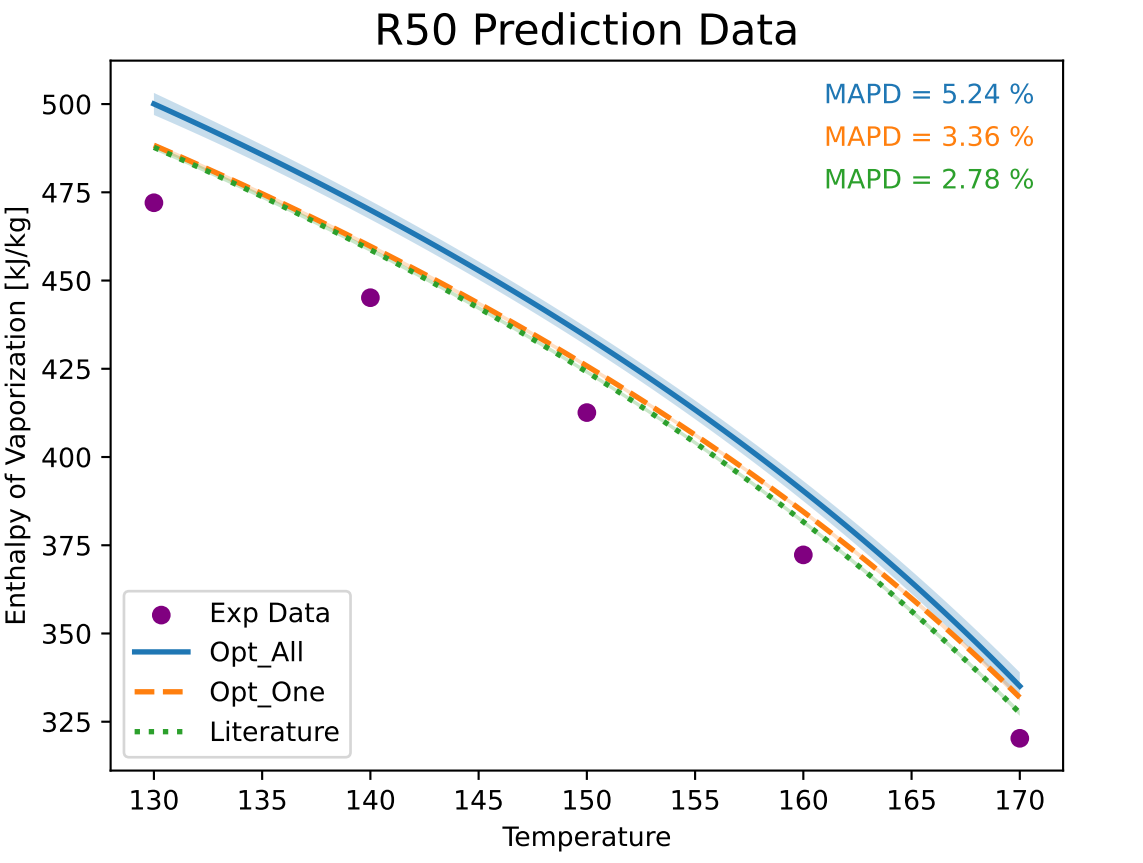

R32 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
Temperature
35
30
25
20
15
10
5
240
250
260
270
280
290
300
310
320
MAPD = 1.89 %
MAPD = 0.56 %
MAPD = 21.16 %

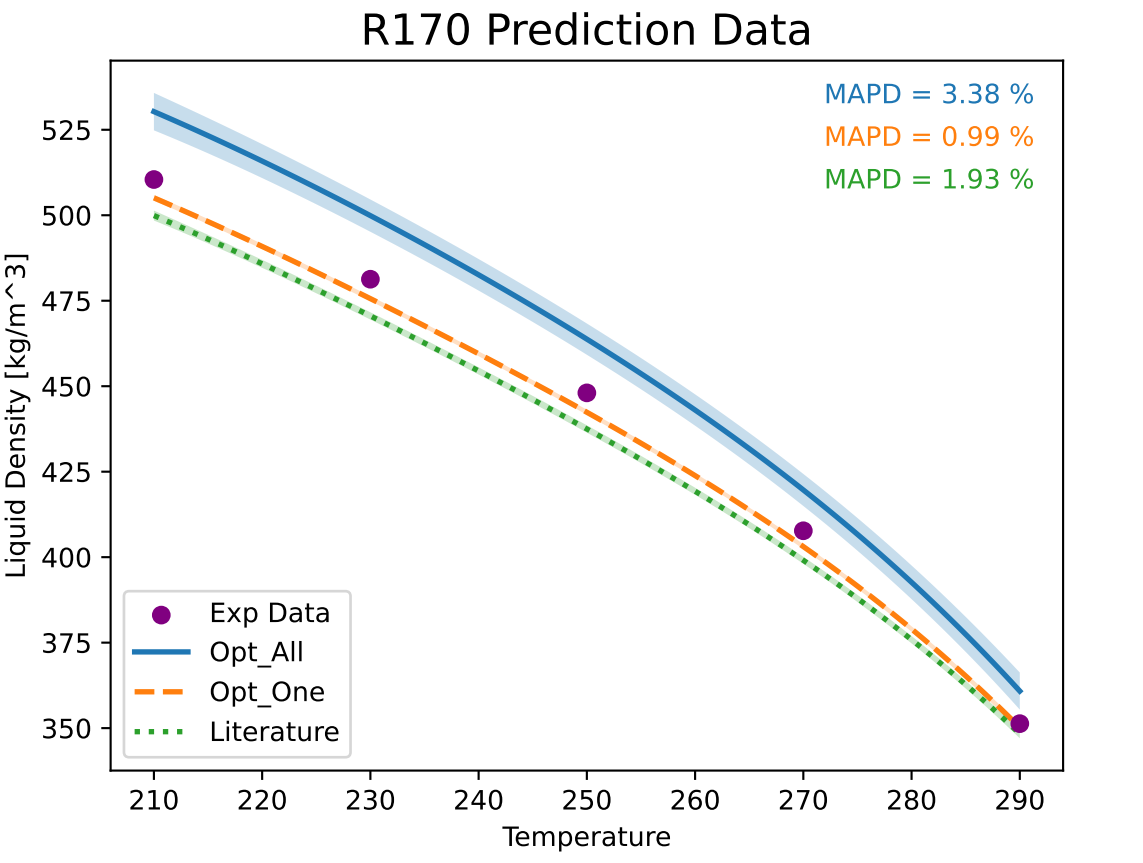

R32 Prediction Data
MAPD = 2.83 %
MAPD = 0.71 %
MAPD = 0.07 %
Exp Data
Opt_All
Opt_One
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
350
325
300
275
250
225
200
240
250
260
270
280
290
300
310
320

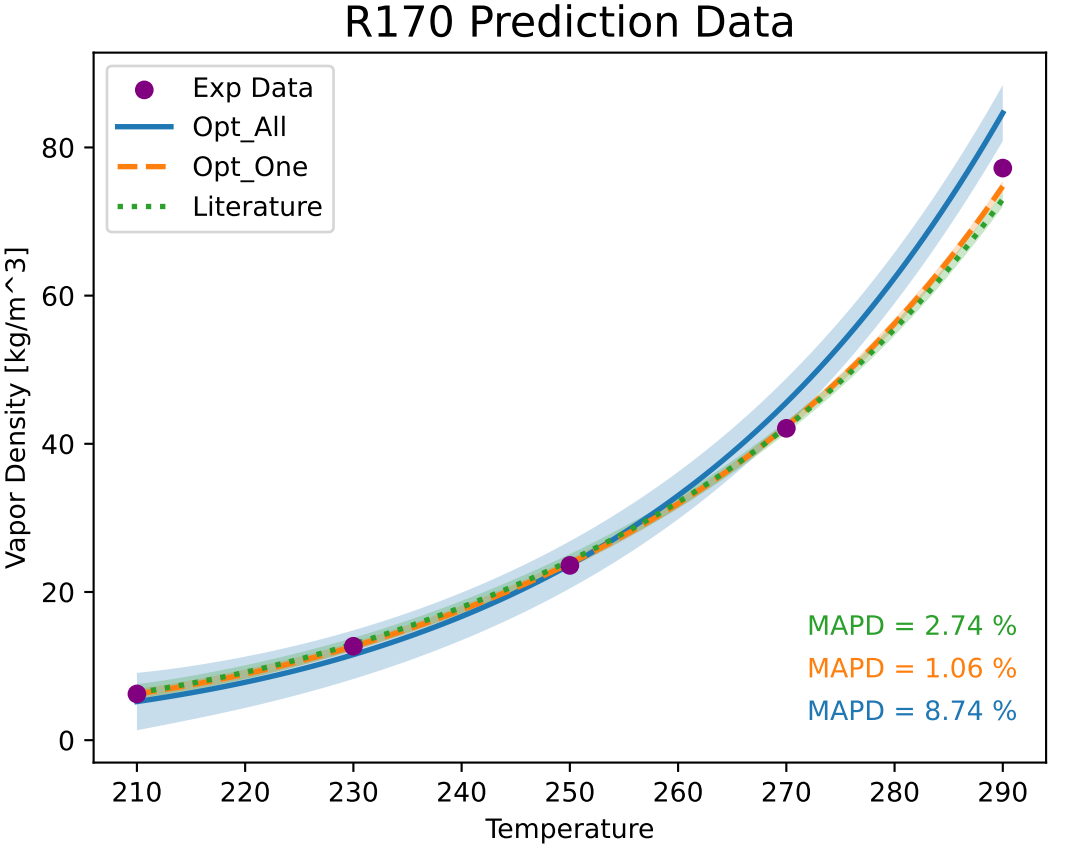

R50 Prediction Data
MAPD = 0.56 %
MAPD = 1.10 %
MAPD = 3.33 %
Liquid Density [kg/m^3]
Temperature
400
380
360
340
320
300
130
135
140
145
150
155
160
165
170
Exp Data
Opt_All
Opt_One
Literature

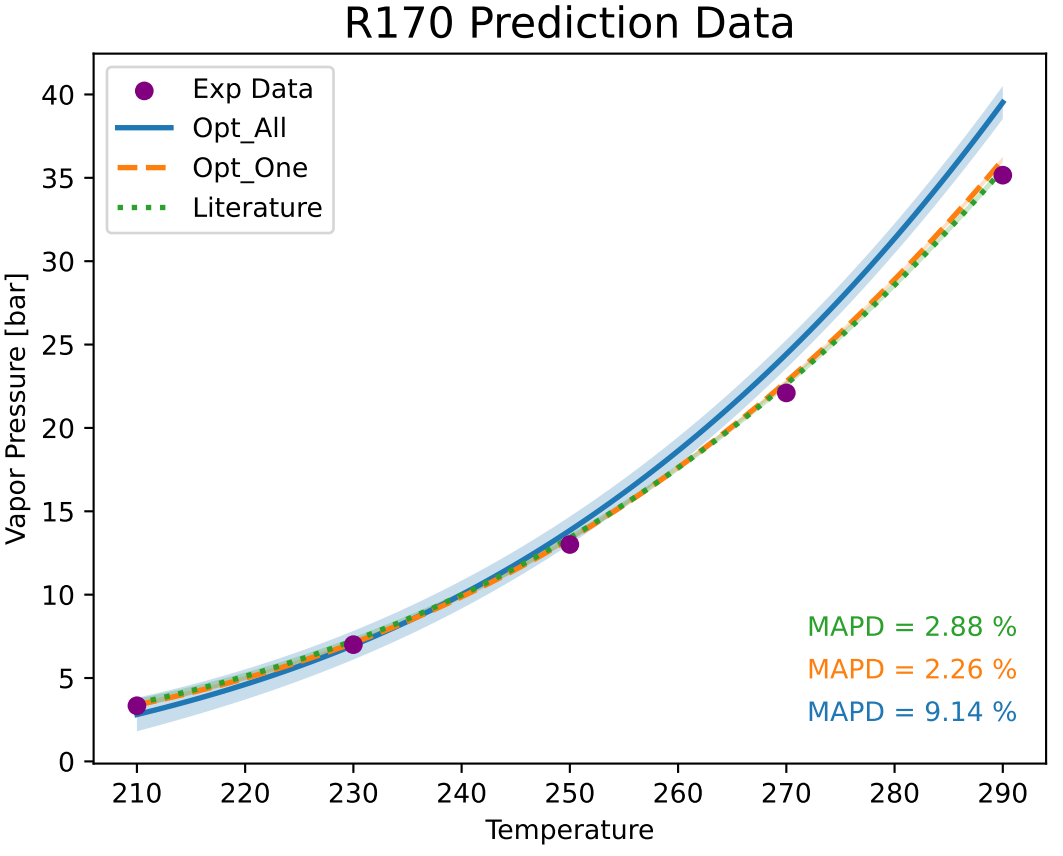

R50 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 0.78 %
MAPD = 0.30 %
MAPD = 1.29 %

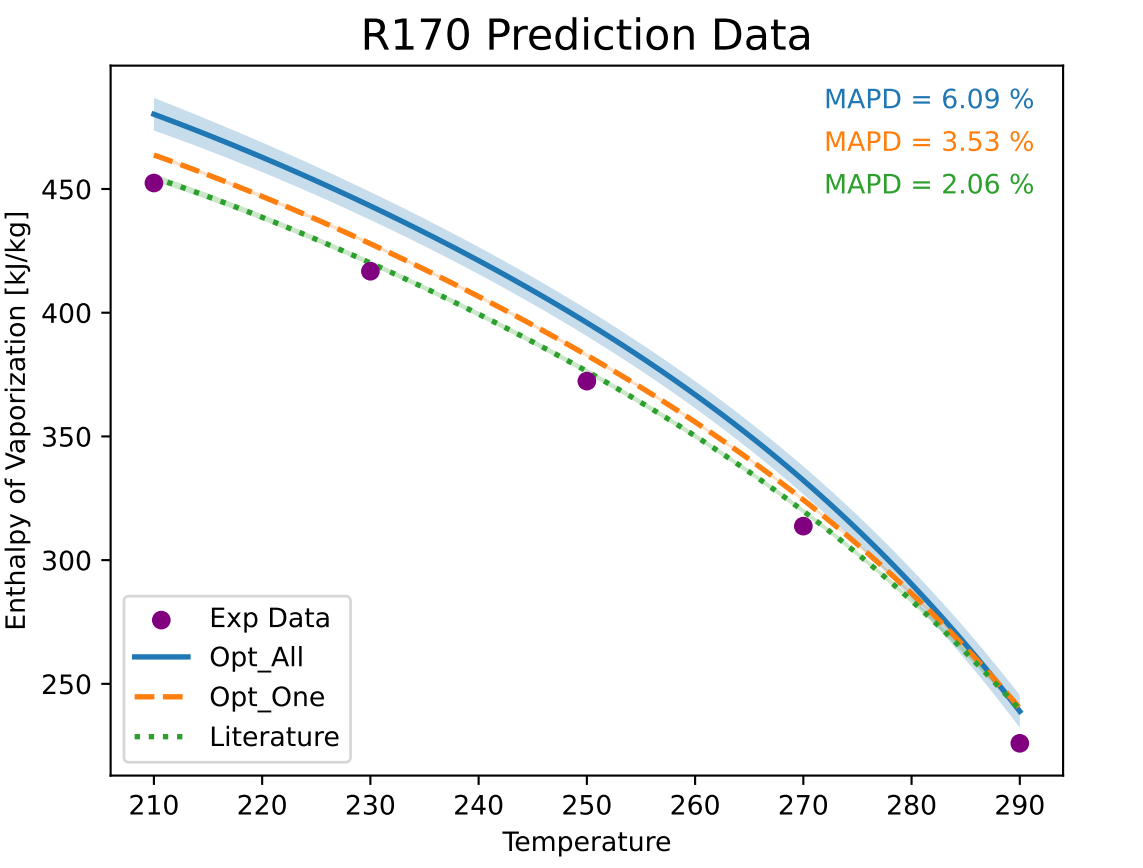

R50 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
Temperature
25
20
15
10
5
130
135
140
145
150
155
160
165
170
MAPD = 2.09 %
MAPD = 1.76 %
MAPD = 2.93 %

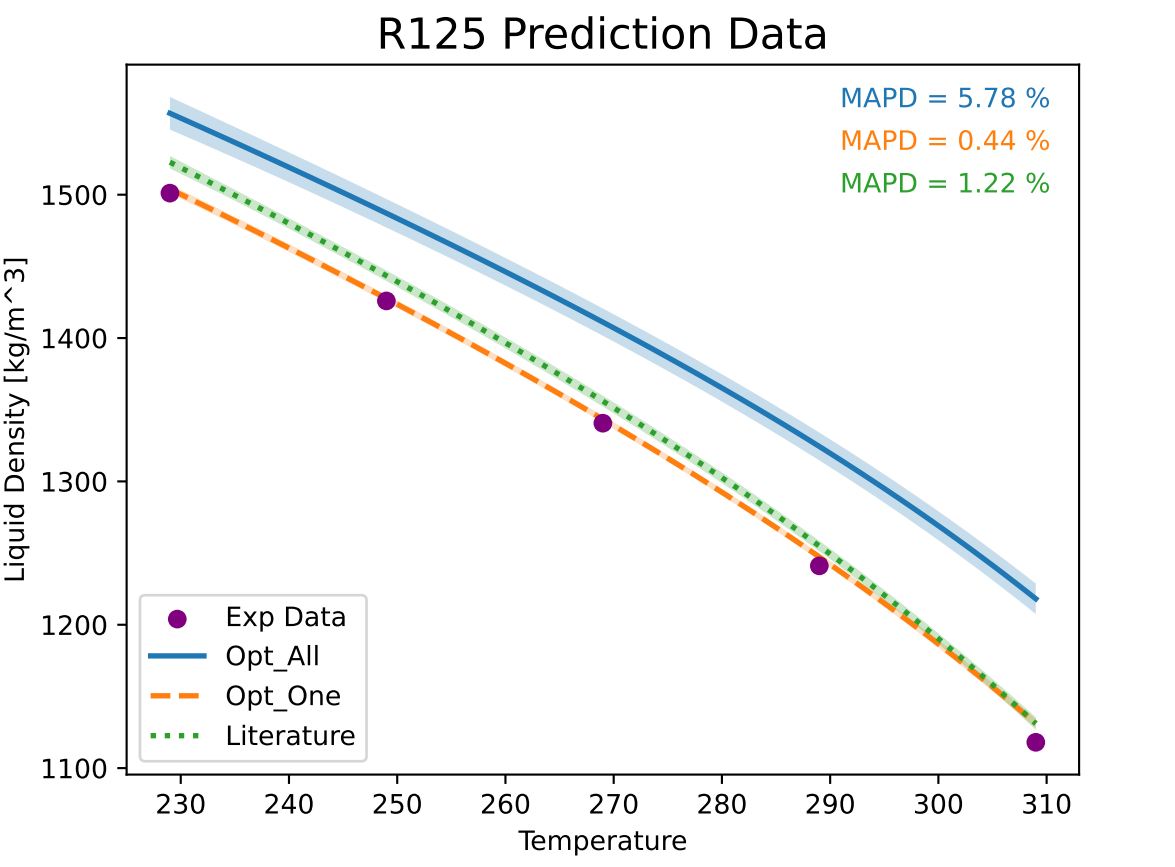

R50 Prediction Data
MAPD = 5.24 %
MAPD = 3.36 %
MAPD = 2.78 %
Exp Data
Opt_All
Opt_One
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
500
475
450
425
400
375
350
325
130
135
140
145
150
155
160
165
170

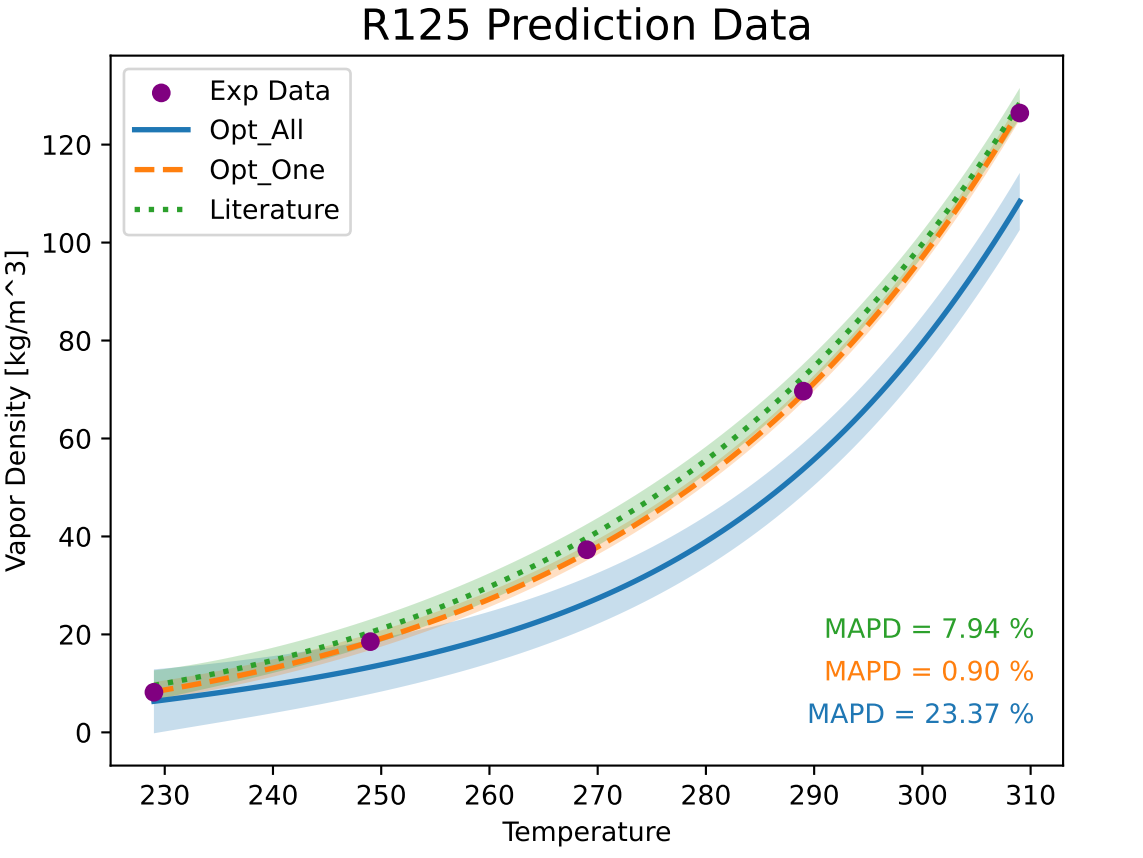

R170 Prediction Data
MAPD = 3.38 %
MAPD = 0.99 %
MAPD = 1.93 %
Liquid Density [kg/m^3]
525
500
475
450
425
400
375
350
210
220
230
240
250
260
270
280
290
Temperature
Exp Data
Opt_All
Opt_One
Literature

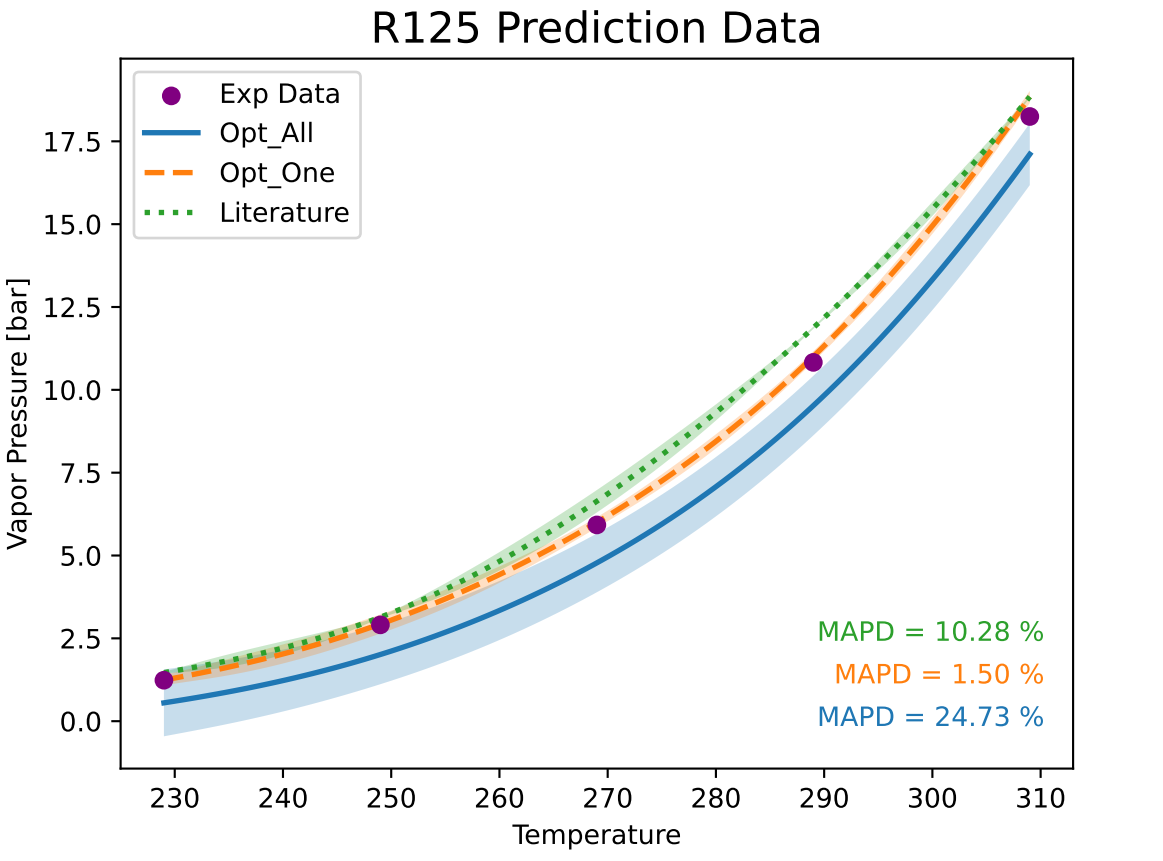

R170 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
0
20
40
60
80
210
220
230
240
250
260
270
280
290
Temperature
MAPD = 2.74 %
MAPD = 1.06 %
MAPD = 8.74 %

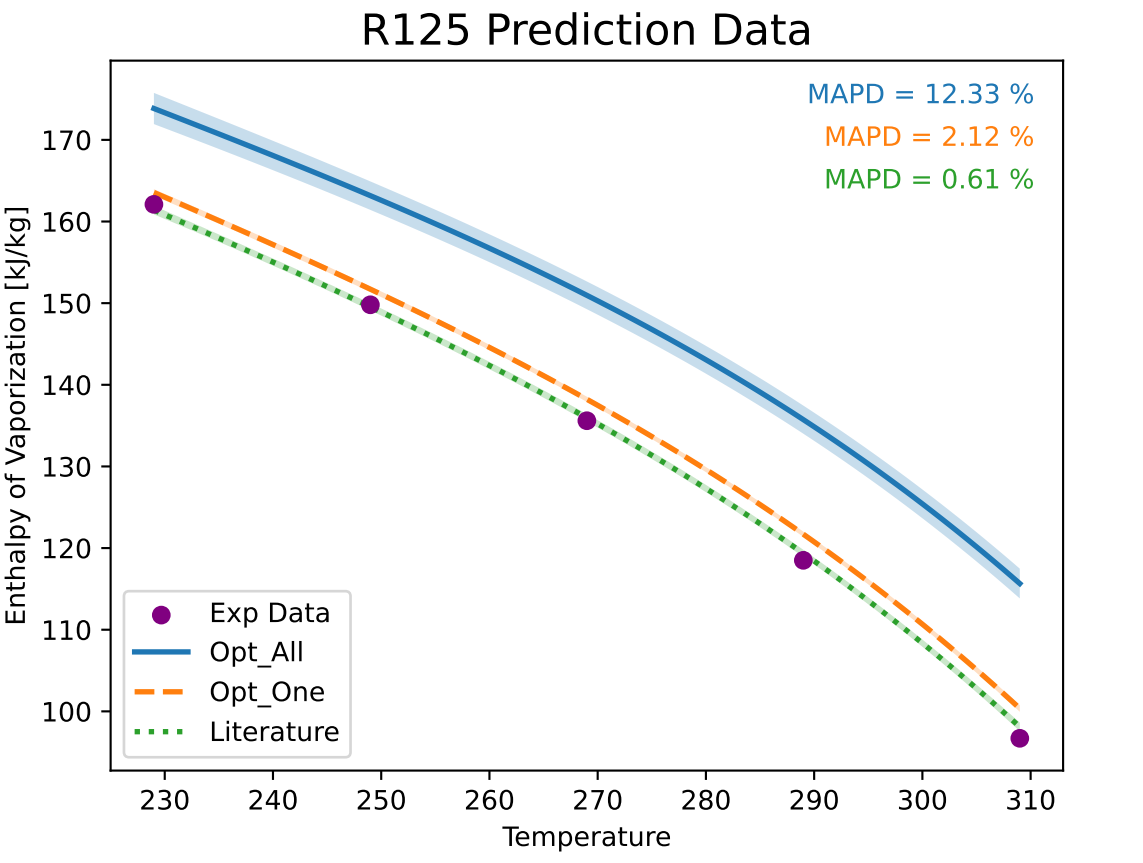

R170 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
Temperature
0
5
10
15
20
25
30
35
40
210
220
230
240
250
260
270
280
290
MAPD = 2.88 %
MAPD = 2.26 %
MAPD = 9.14 %

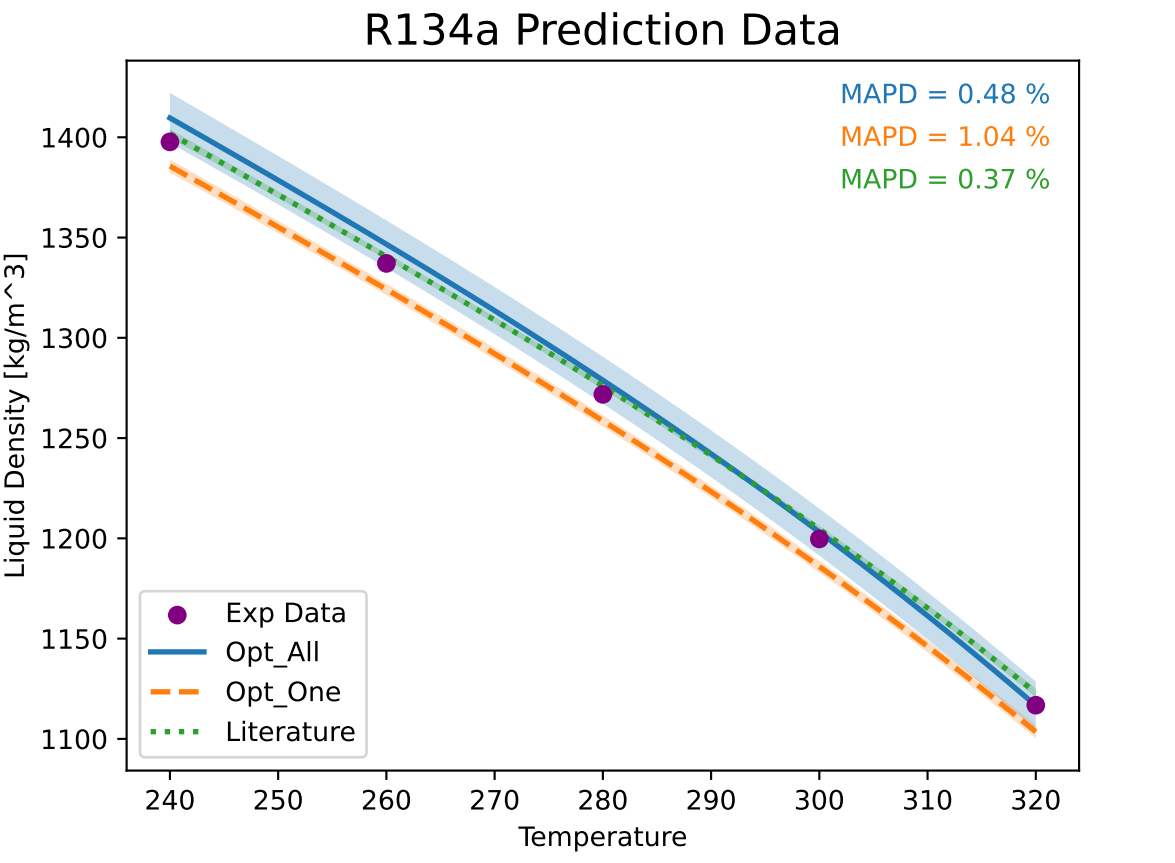

R170 Prediction Data
MAPD = 6.09 %
MAPD = 3.53 %
MAPD = 2.06 %
Enthalpy of Vaporization [kJ/kg]
Temperature
Exp Data
Opt_All
Opt_One
Literature
450
400
350
300
250
210
220
230
240
250
260
270
280
290

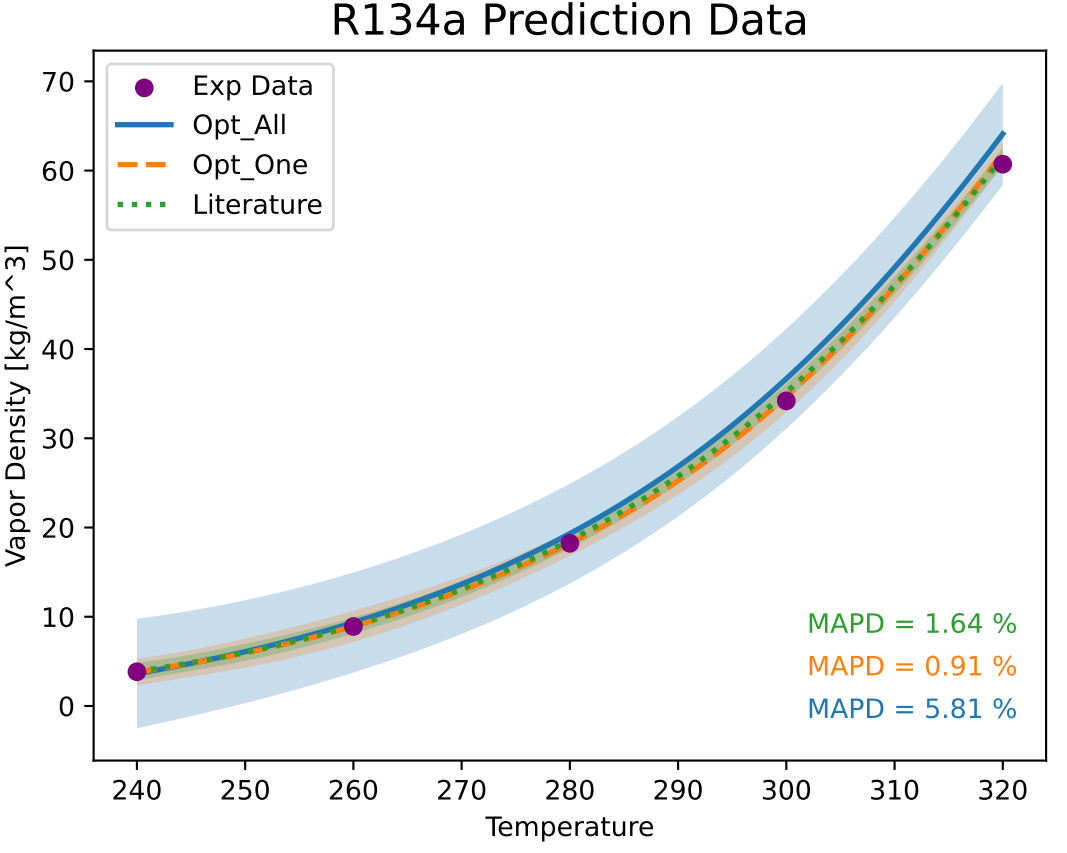

R125 Prediction Data
MAPD = 5.78 %
MAPD = 0.44 %
MAPD = 1.22 %
Liquid Density [kg/m^3]
1500
1400
1300
1200
1100
230
240
250
260
270
280
290
300
310
Temperature
Exp Data
Opt_All
Opt_One
Literature

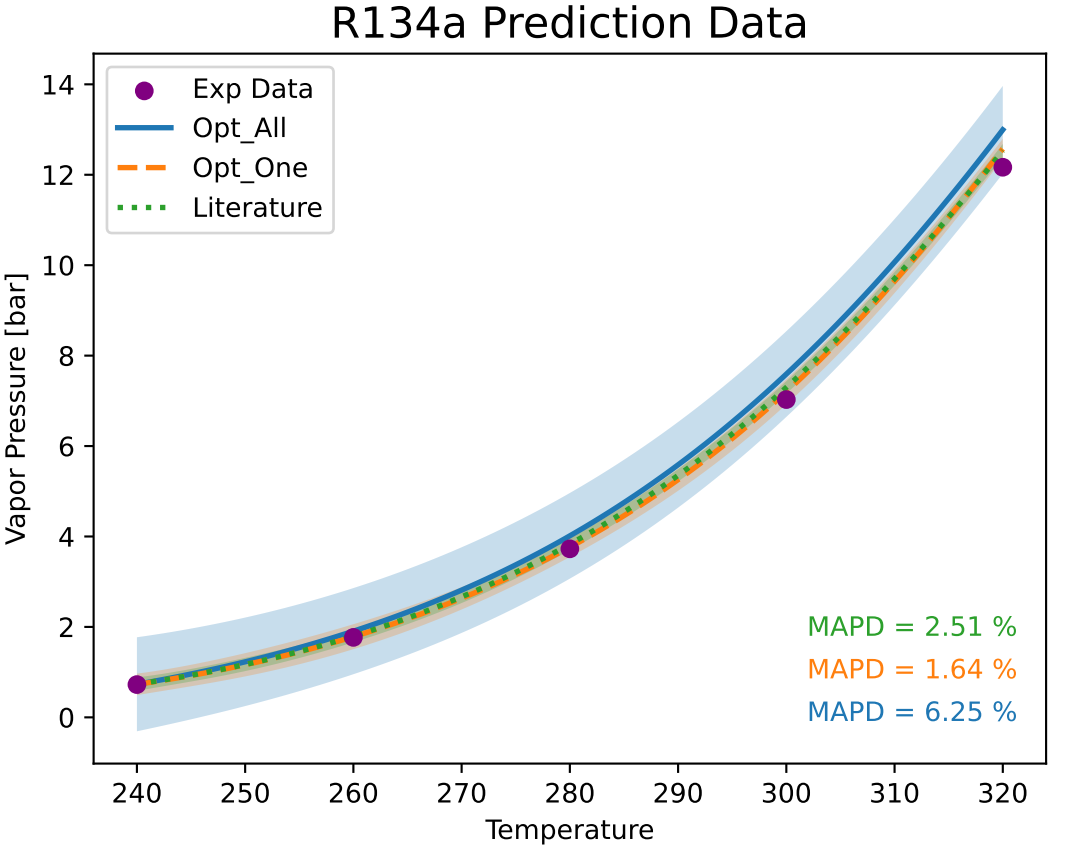

R125 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
Temperature
0
20
40
60
80
100
120
230
240
250
260
270
280
290
300
310
MAPD = 7.94 %
MAPD = 0.90 %
MAPD = 23.37 %

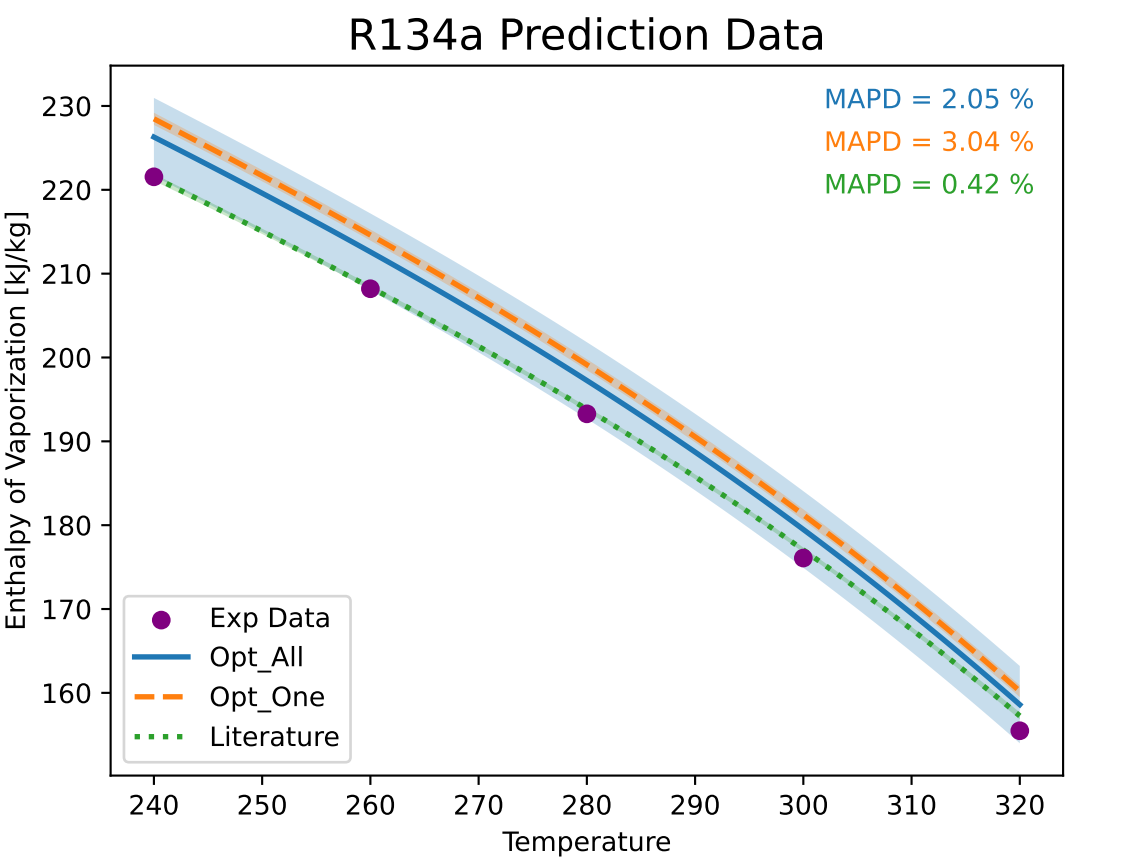

R125 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
Temperature
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
230
240
250
260
270
280
290
300
310
MAPD = 10.28 %
MAPD = 1.50 %
MAPD = 24.73 %

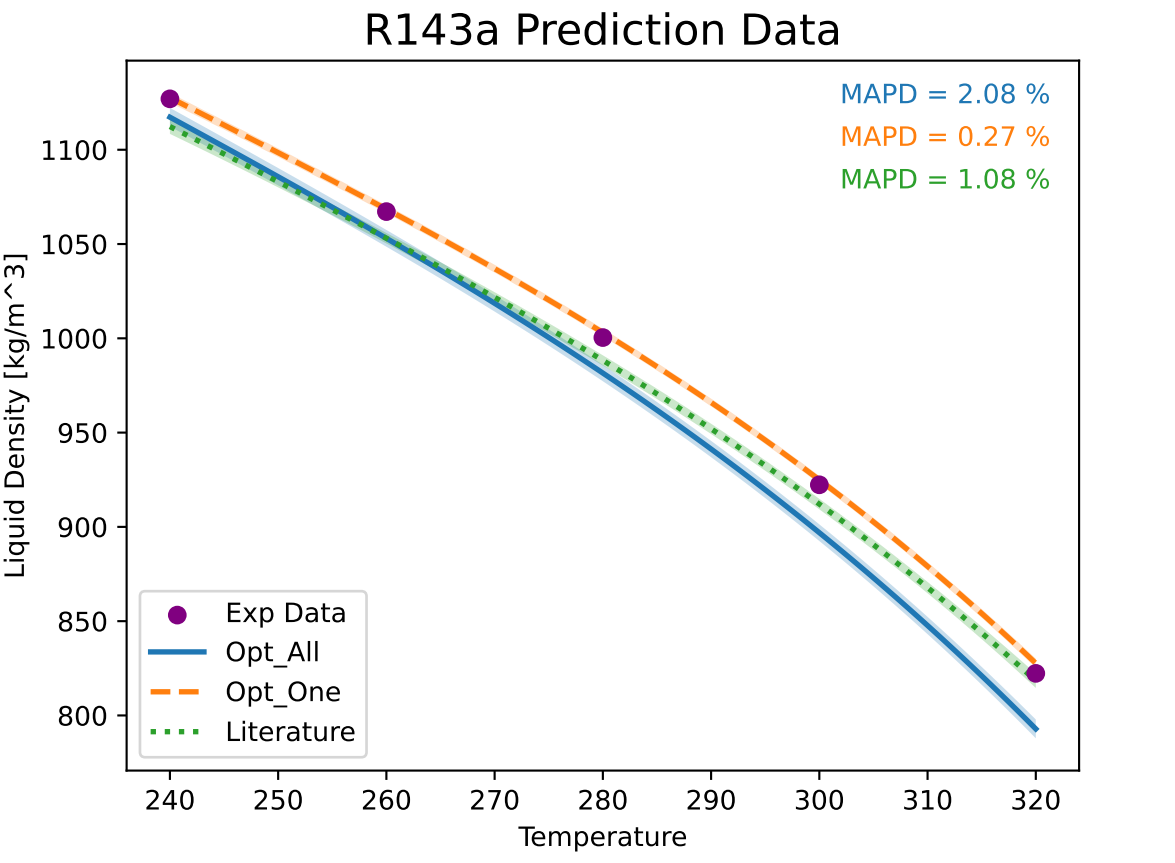

R125 Prediction Data
MAPD = 12.33 %
MAPD = 2.12 %
MAPD = 0.61 %
Exp Data
Opt_All
Opt_One
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
100
110
120
130
140
150
160
170
230
240
250
260
270
280
290
300
310

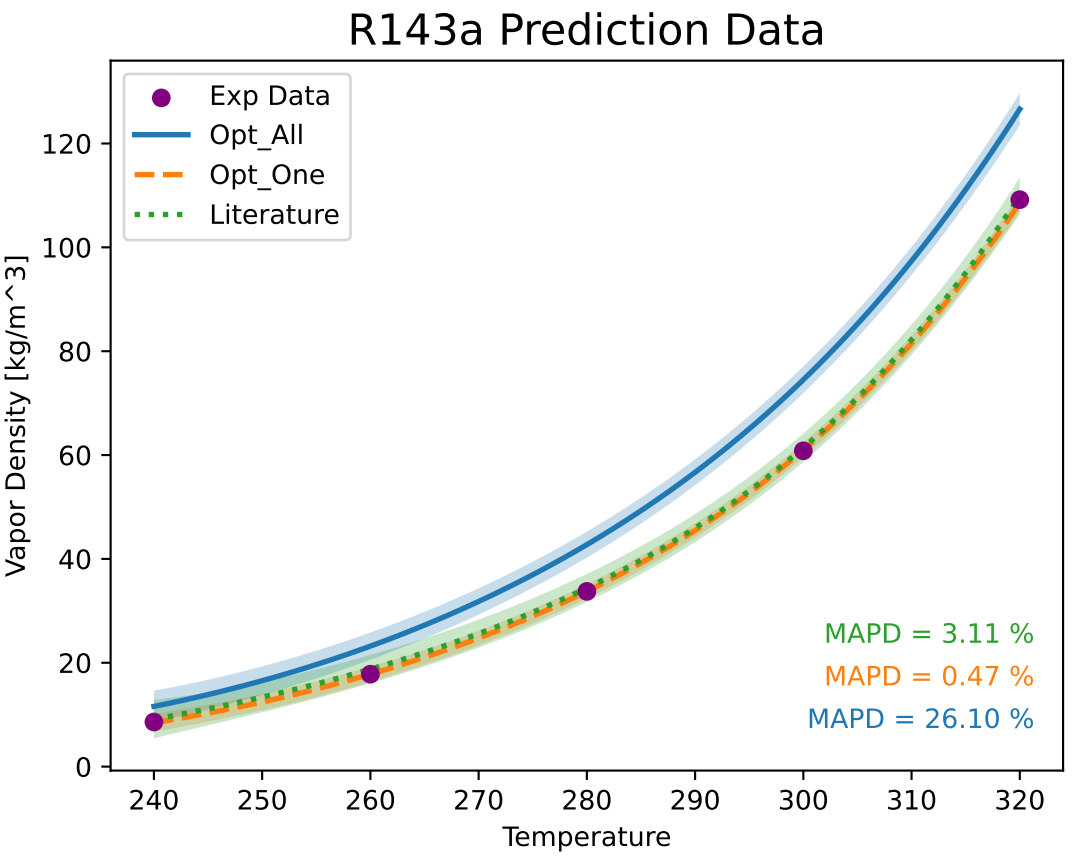

R134a Prediction Data
MAPD = 0.48 %
MAPD = 1.04 %
MAPD = 0.37 %
Liquid Density [kg/m^3]
1400
1350
1300
1250
1200
1150
1100
240
250
260
270
280
290
300
310
320
Temperature
Exp Data
Opt_All
Opt_One
Literature

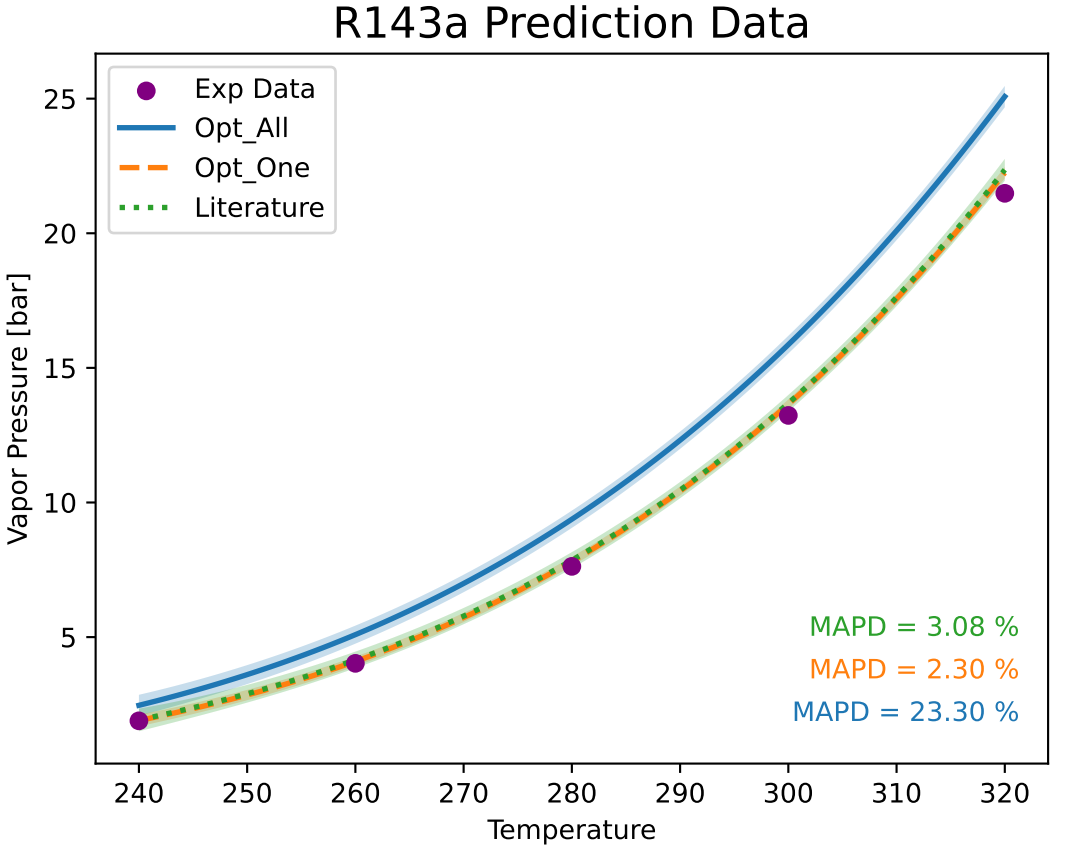

R134a Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 1.64 %
MAPD = 0.91 %
MAPD = 5.81 %
0
10
20
30
40
50
60
70
240
250
260
270
280
290
300
310
320

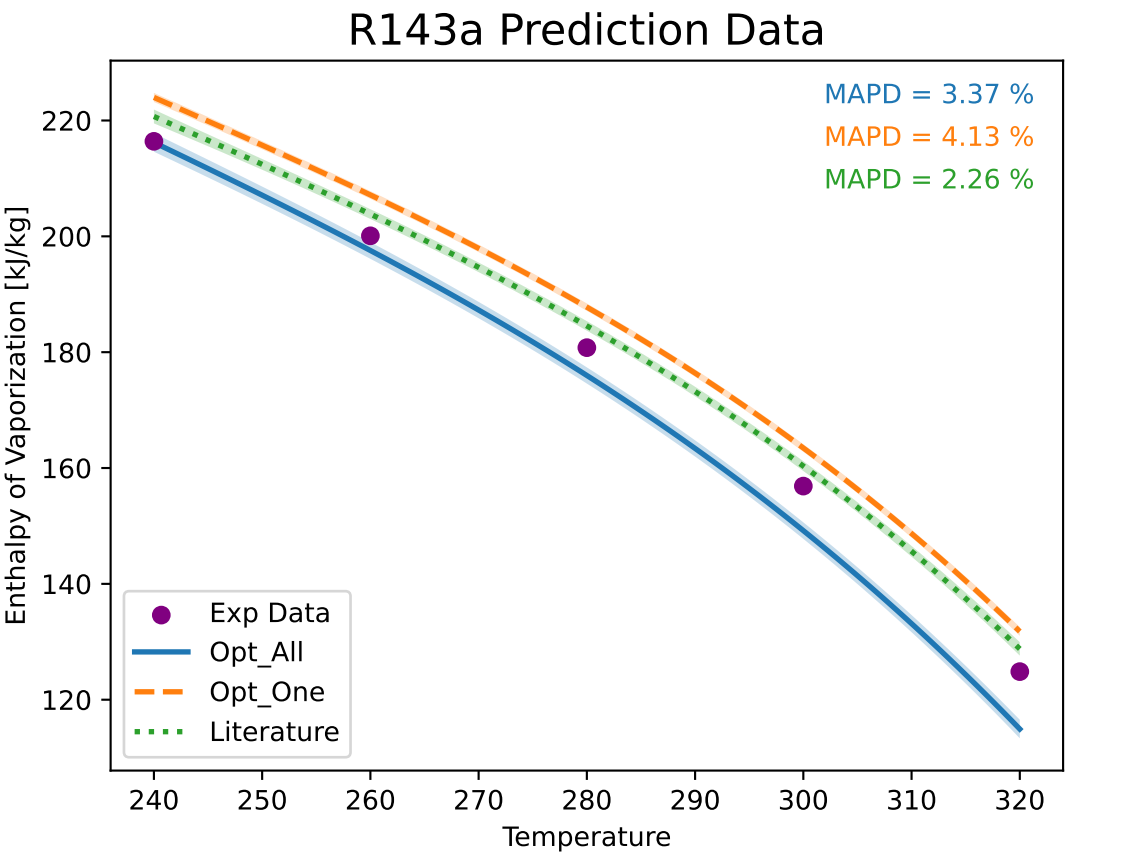

R134a Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
Temperature
MAPD = 2.51 %
MAPD = 1.64 %
MAPD = 6.25 %
0
2
4
6
8
10
12
14
240
250
260
270
280
290
300
310
320

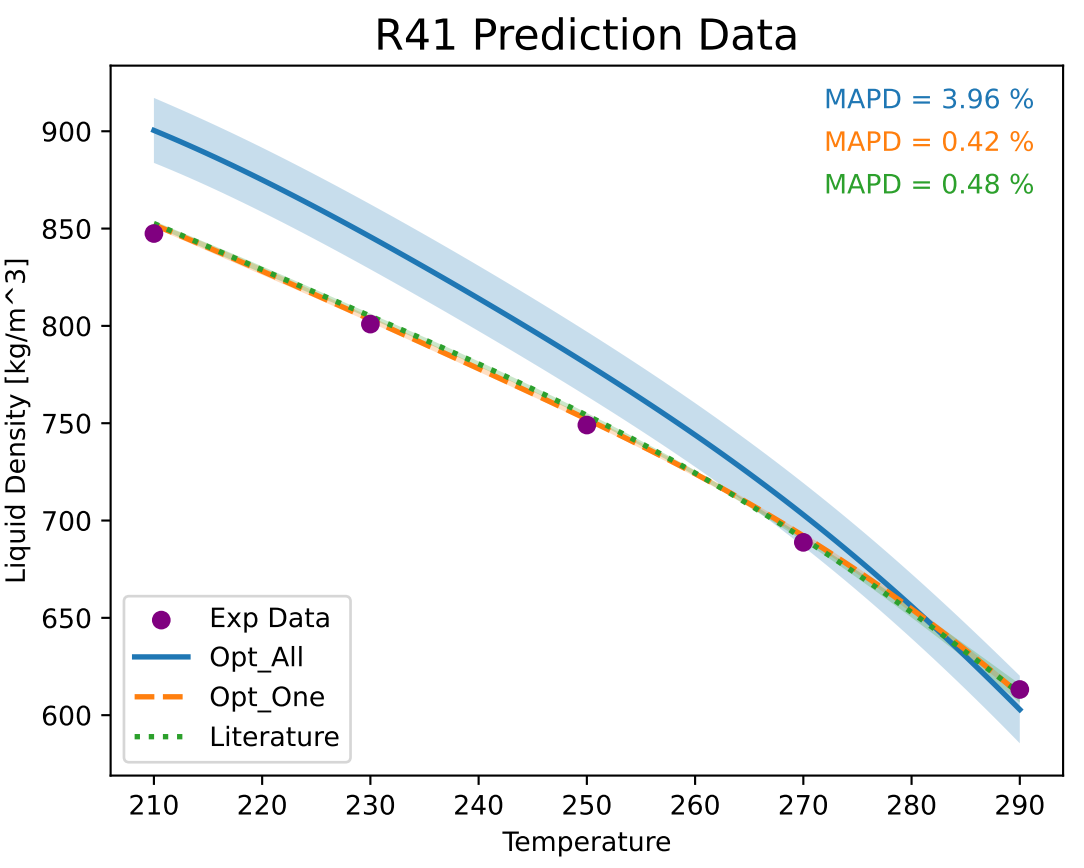

R134a Prediction Data
MAPD = 2.05 %
MAPD = 3.04 %
MAPD = 0.42 %
Enthalpy of Vaporization [kJ/kg]
Temperature
230
220
210
200
190
180
170
160
240
250
260
270
280
290
300
310
320
Exp Data
Opt_All
Opt_One
Literature

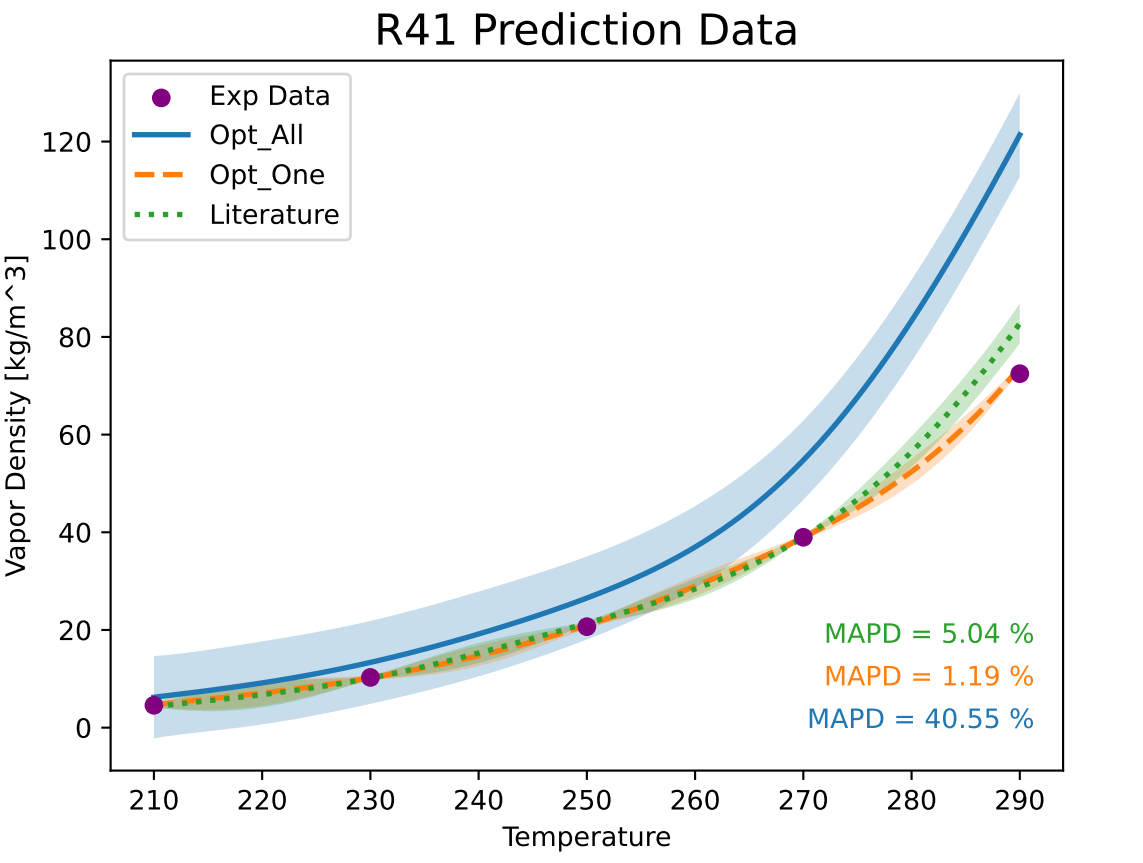

R143a Prediction Data
MAPD = 2.08 %
MAPD = 0.27 %
MAPD = 1.08 %
Liquid Density [kg/m^3]
1100
1050
1000
950
900
850
800
240
250
260
270
280
290
300
310
320
Temperature
Exp Data
Opt_All
Opt_One
Literature

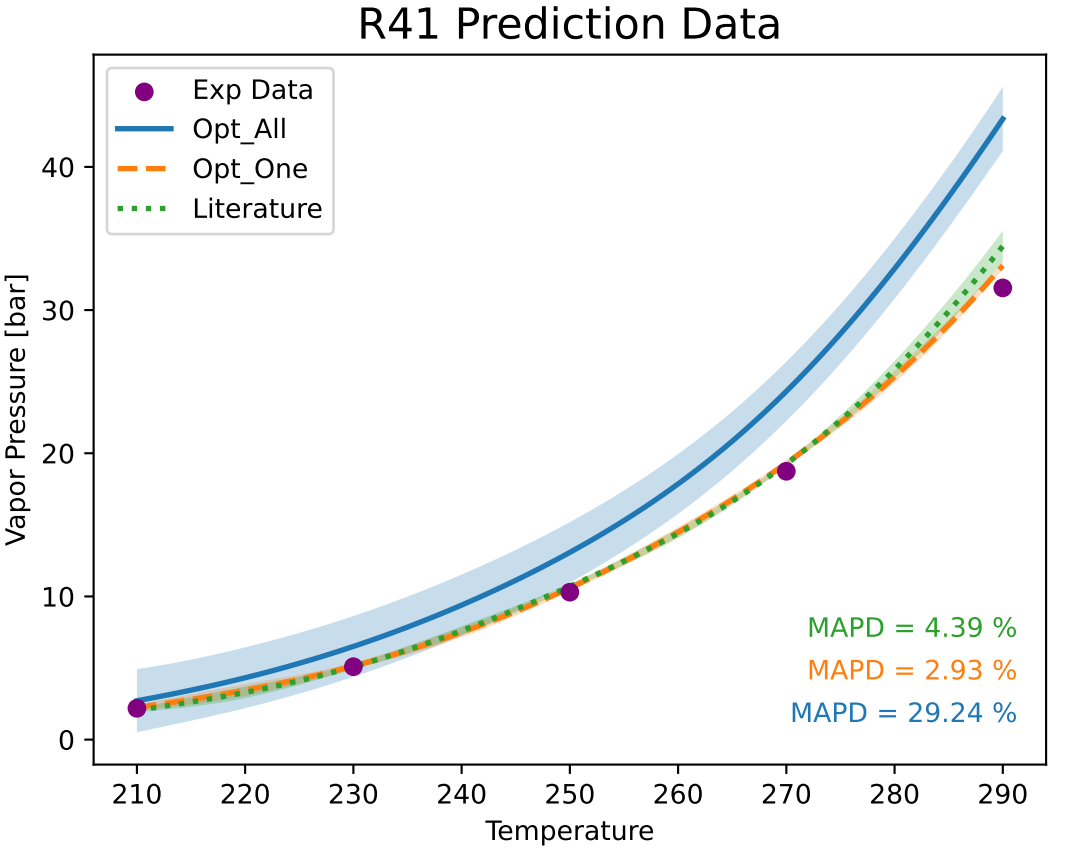

R143a Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
Temperature
0
20
40
60
80
100
120
240
250
260
270
280
290
300
310
320
MAPD = 3.11 %
MAPD = 0.47 %
MAPD = 26.10 %

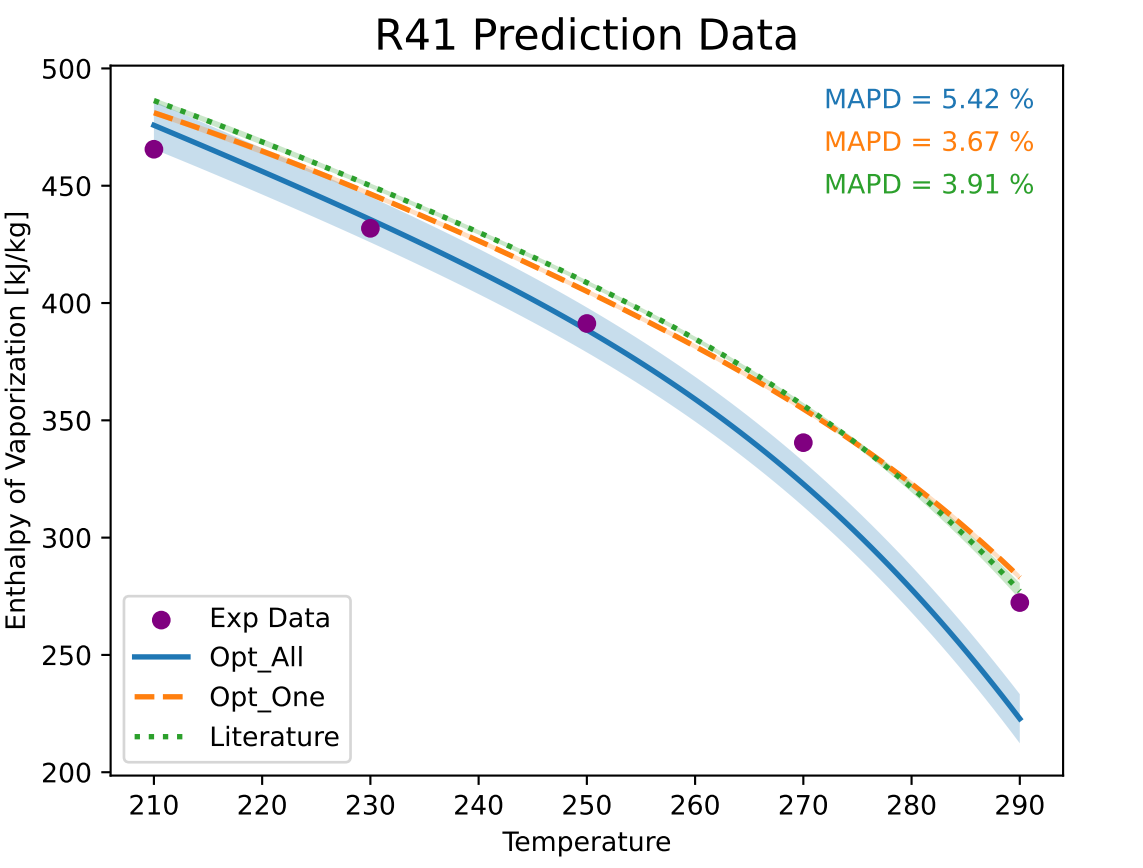

R143a Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
Temperature
25
20
15
10
5
240
250
260
270
280
290
300
310
320
MAPD = 3.08 %
MAPD = 2.30 %
MAPD = 23.30 %


R143a Prediction Data
MAPD = 3.37 %
MAPD = 4.13 %
MAPD = 2.26 %
Enthalpy of Vaporization [kJ/kg]
Temperature
220
200
180
160
140
120
240
250
260
270
280
290
300
310
320
Exp Data
Opt_All
Opt_One
Literature


R41 Prediction Data
MAPD = 3.96 %
MAPD = 0.42 %
MAPD = 0.48 %
Liquid Density [kg/m^3]
900
850
800
750
700
650
600
210
220
230
240
250
260
270
280
290
Temperature
Exp Data
Opt_All
Opt_One
Literature


R41 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 5.04 %
MAPD = 1.19 %
MAPD = 40.55 %
0
20
40
60
80
100
120
210
220
230
240
250
260
270
280
290


R41 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
0
10
20
30
40
210
220
230
240
250
260
270
280
290
Temperature
MAPD = 4.39 %
MAPD = 2.93 %
MAPD = 29.24 %


R41 Prediction Data
MAPD = 5.42 %
MAPD = 3.67 %
MAPD = 3.91 %
Exp Data
Opt_All
Opt_One
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
500
450
400
350
300
250
200
210
220
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