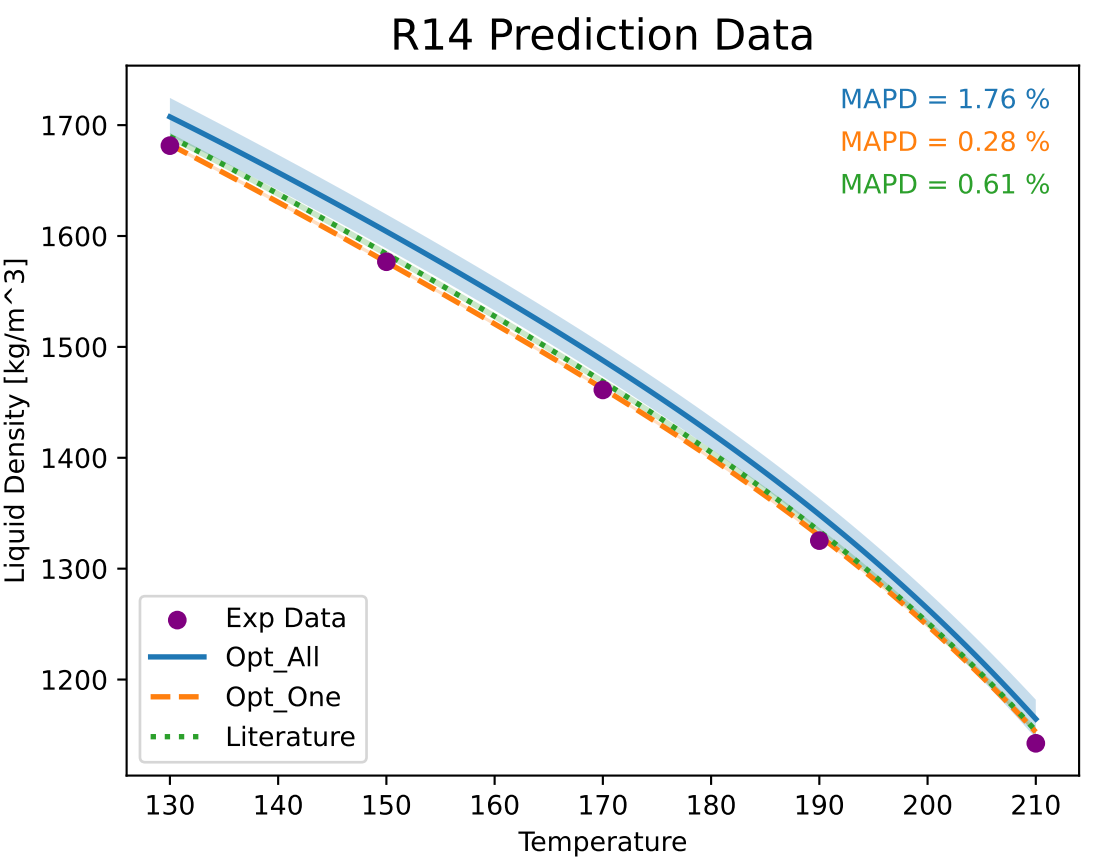
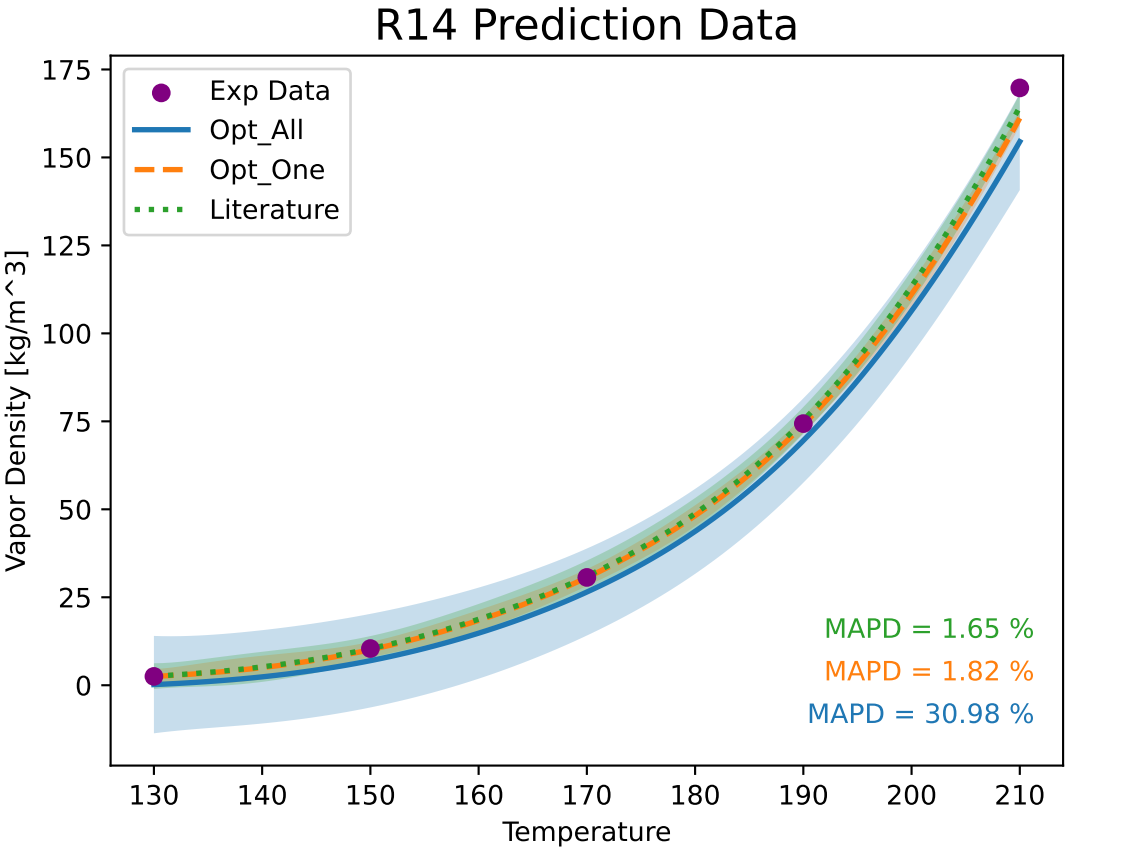
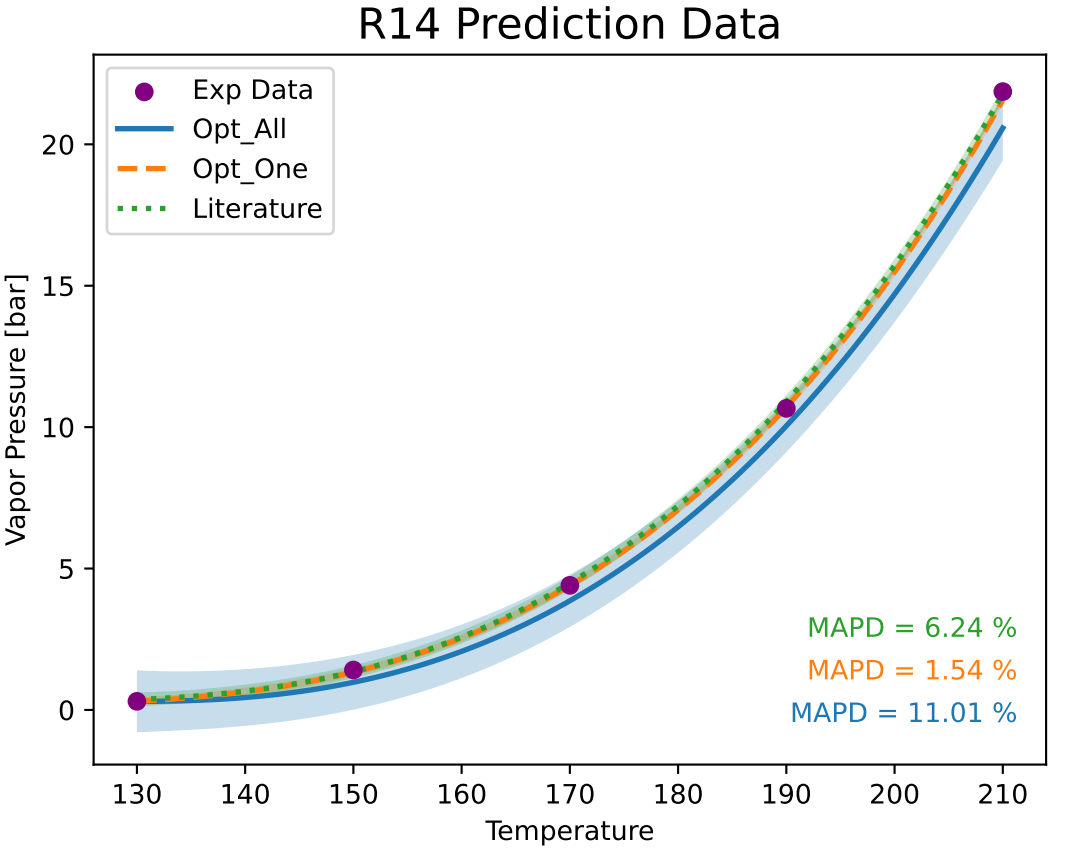
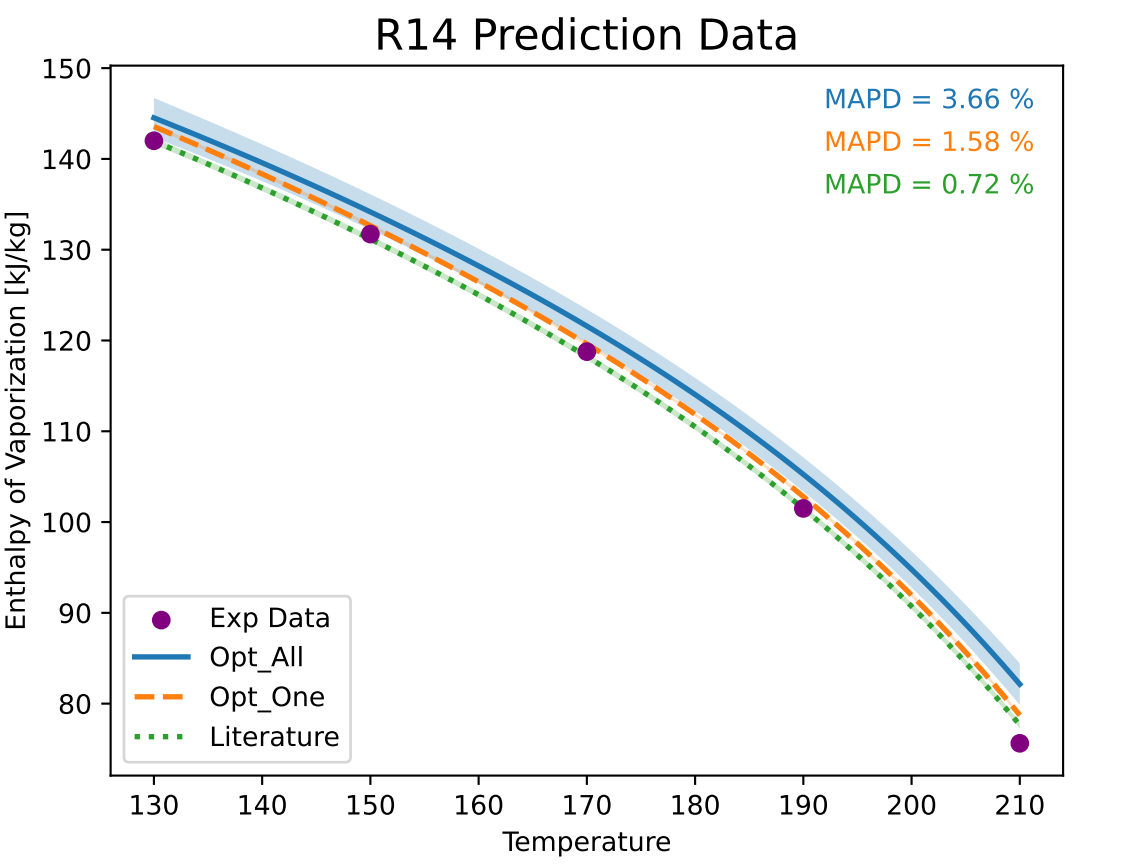
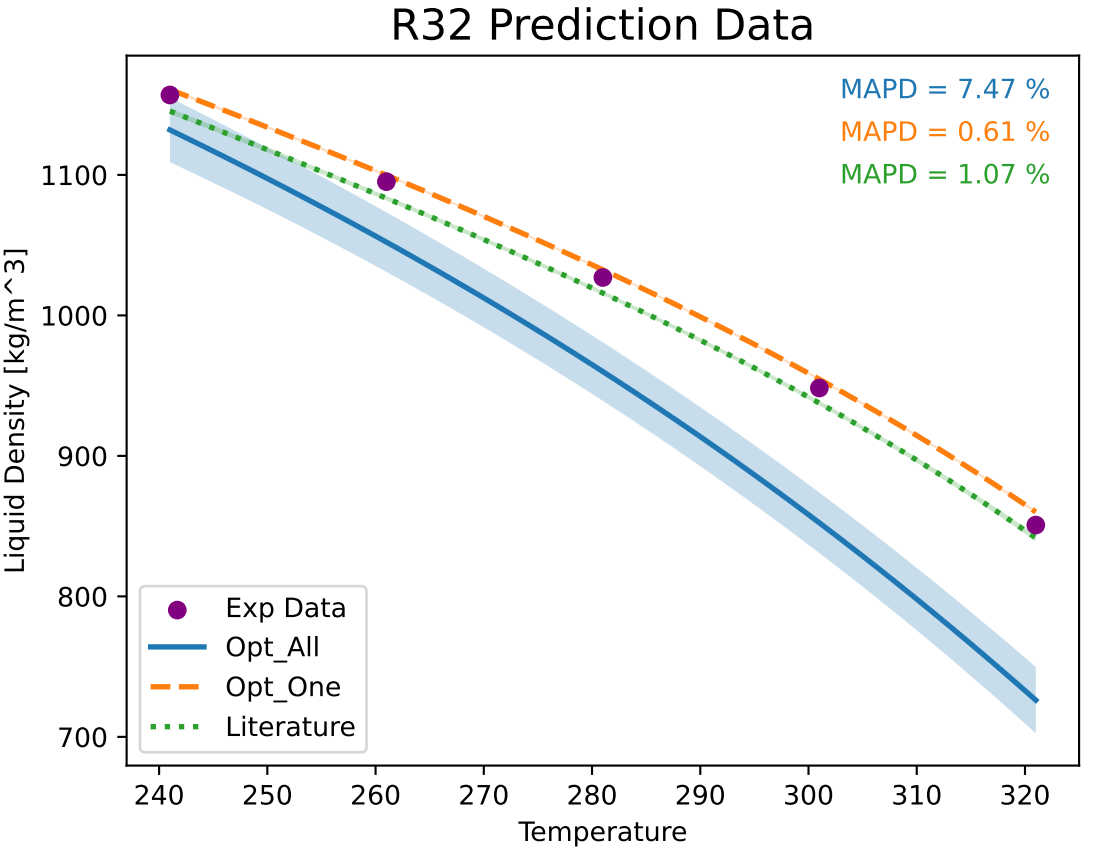
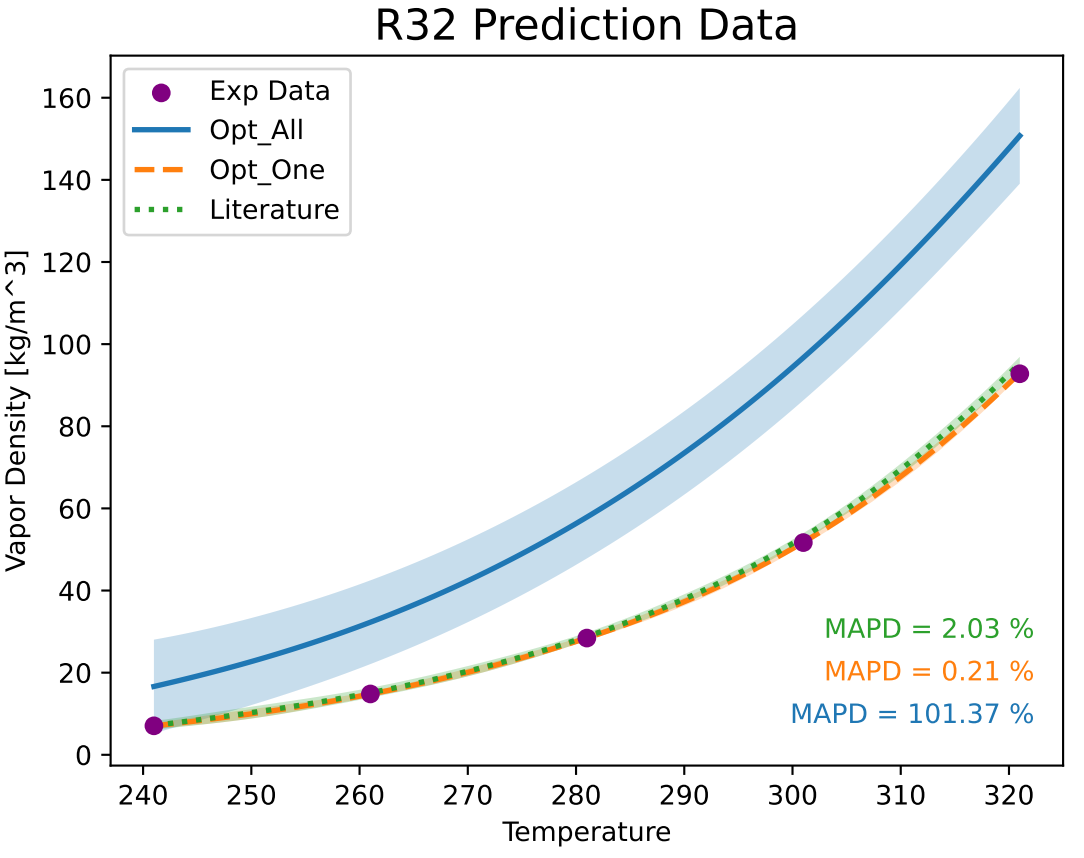

R14 Prediction Data
MAPD = 1.76 %
MAPD = 0.28 %
MAPD = 0.61 %
Liquid Density [kg/m^3]
1700
1600
1500
1400
1300
1200
Exp Data
Opt_All
Opt_One
Literature
130
140
150
160
170
180
190
200
210
Temperature

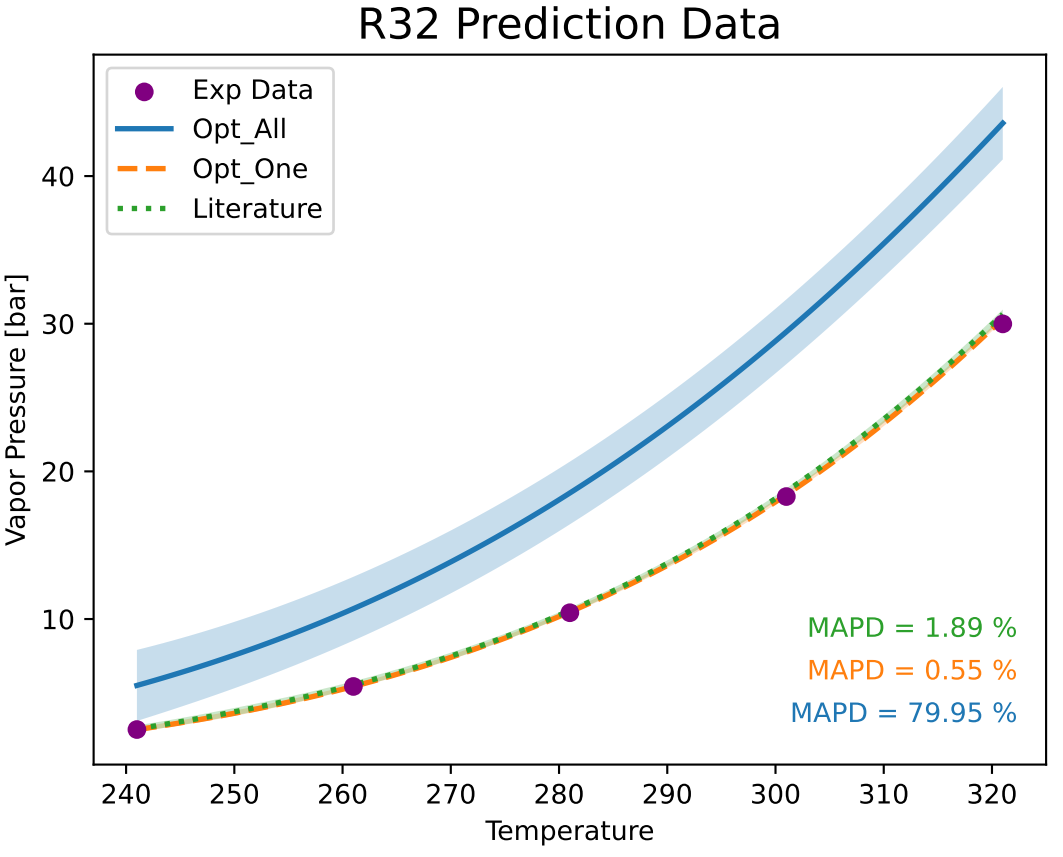

R14 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 1.65 %
MAPD = 1.82 %
MAPD = 30.98 %
175
150
125
100
75
50
25
0
130
140
150
160
170
180
190
200
210

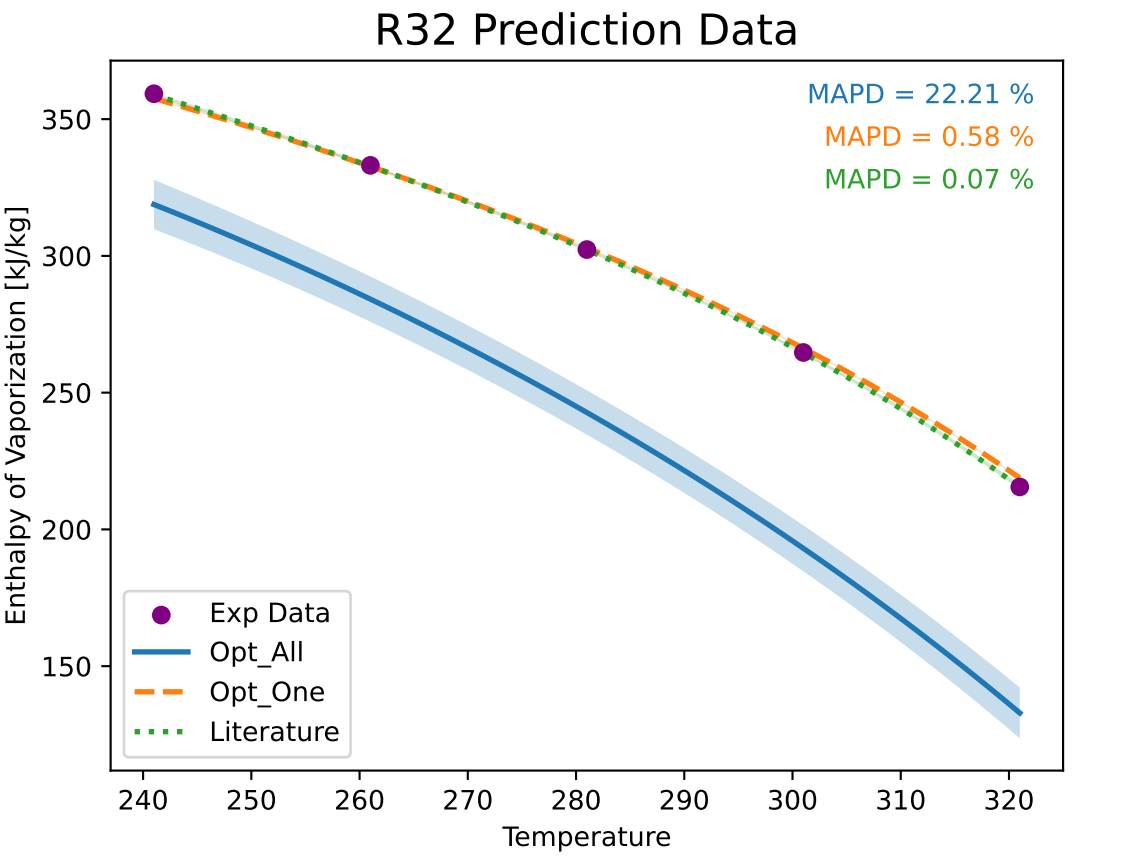

R14 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
Temperature
MAPD = 6.24 %
MAPD = 1.54 %
MAPD = 11.01 %
0
5
10
15
20
130
140
150
160
170
180
190
200
210

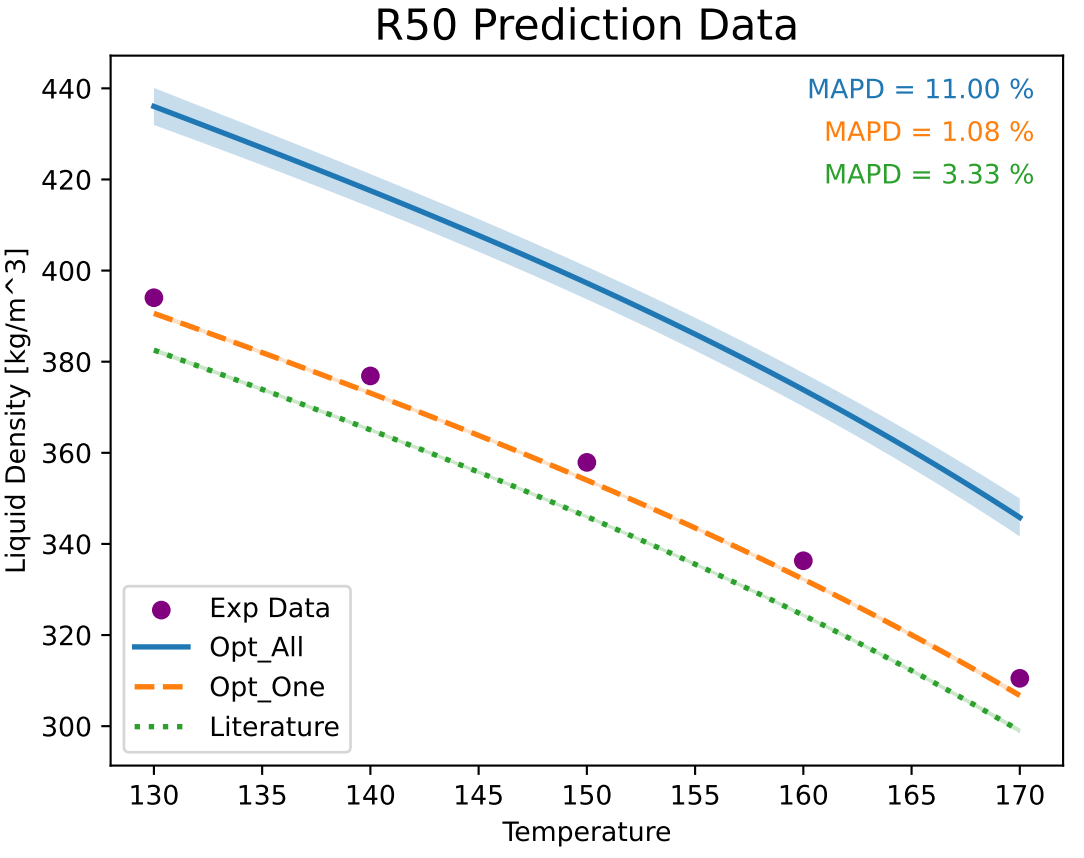

R14 Prediction Data
MAPD = 3.66 %
MAPD = 1.58 %
MAPD = 0.72 %
Exp Data
Opt_All
Opt_One
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
150
140
130
120
110
100
90
80
130
140
150
160
170
180
190
200
210

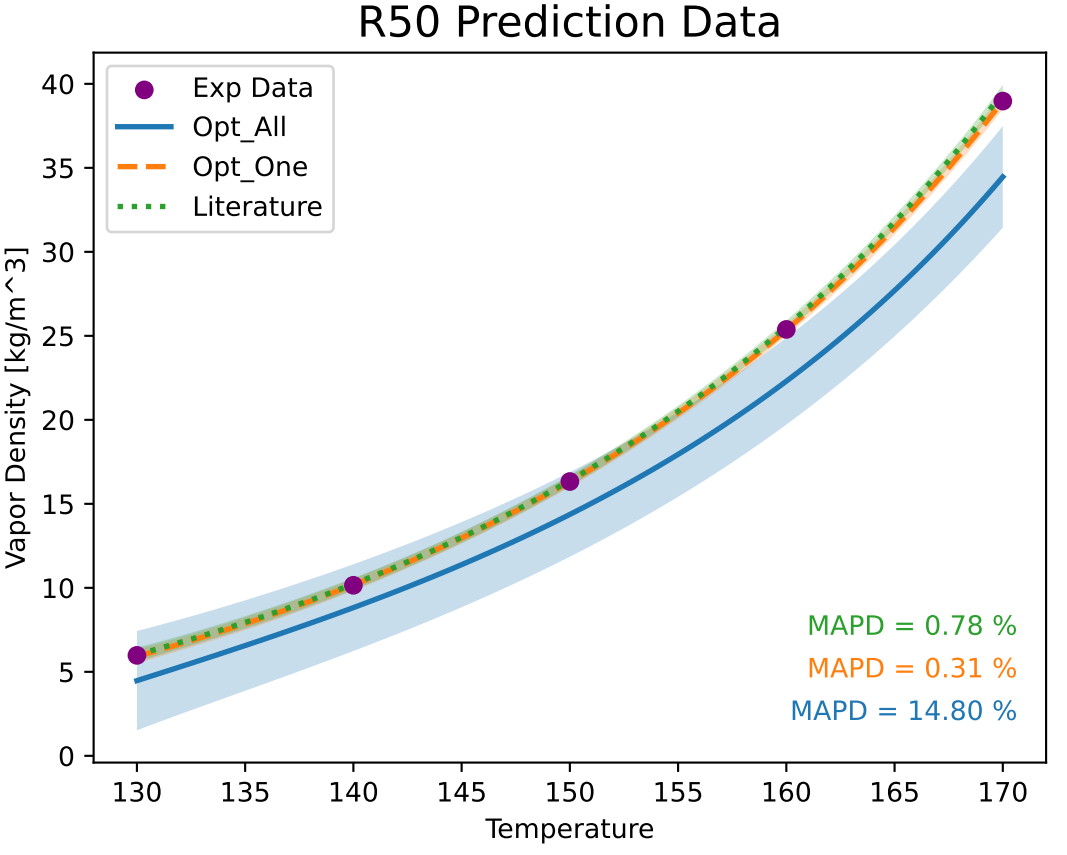

R32 Prediction Data
MAPD = 7.47 %
MAPD = 0.61 %
MAPD = 1.07 %
Liquid Density [kg/m^3]
1100
1000
900
800
700
Exp Data
Opt_All
Opt_One
Literature
240
250
260
270
280
290
300
310
320
Temperature

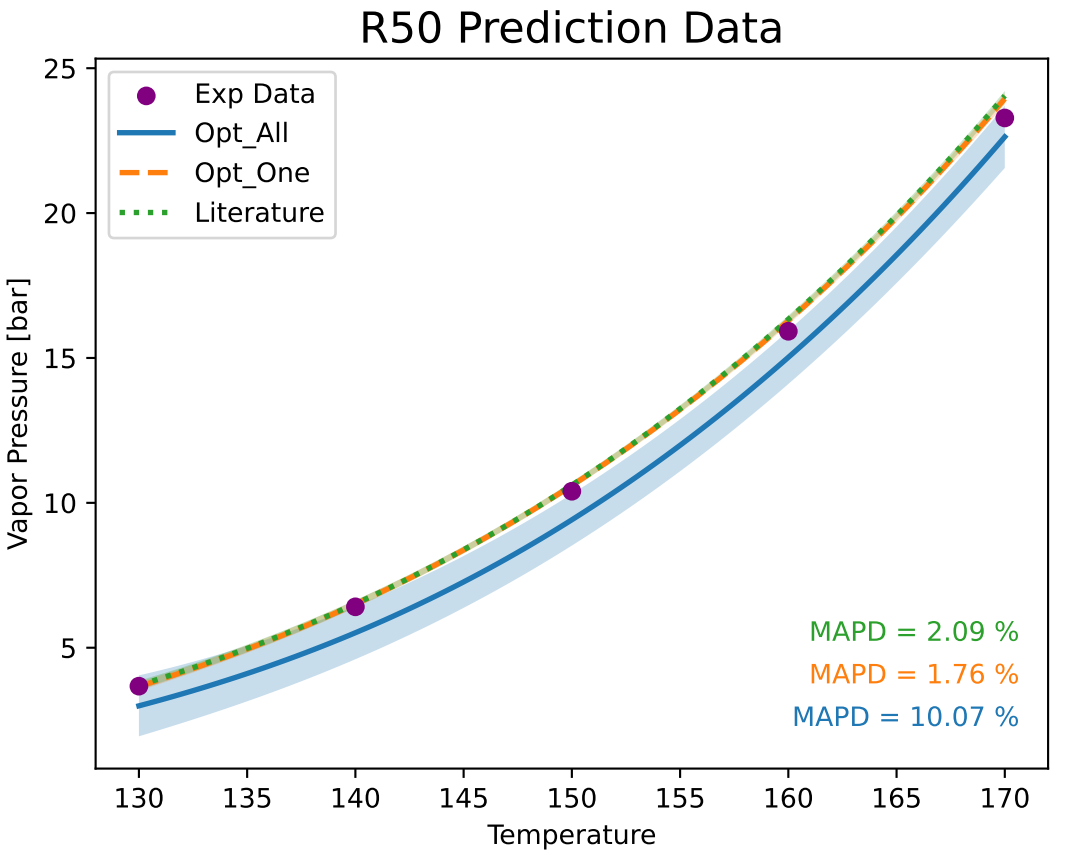

R32 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 2.03 %
MAPD = 0.21 %
MAPD = 101.37 %
0
20
40
60
80
100
120
140
160
240
250
260
270
280
290
300
310
320

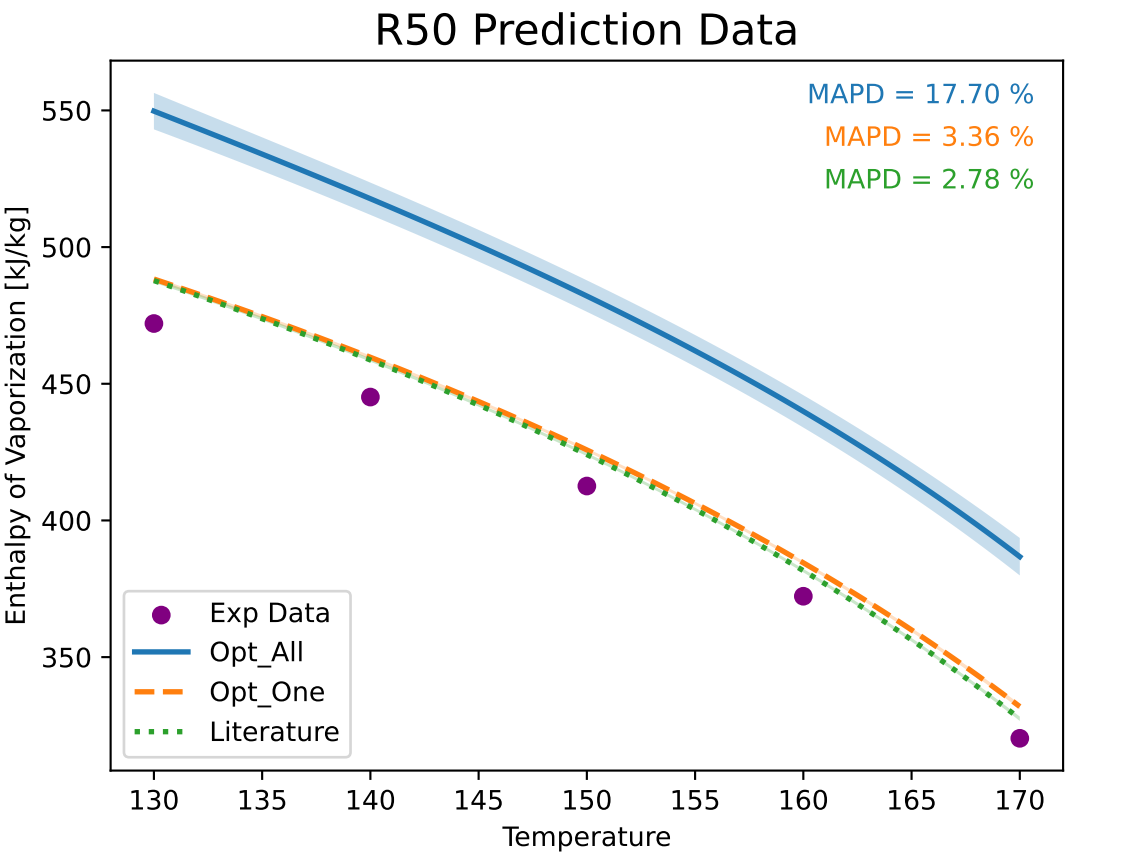

R32 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
10
20
30
40
240
250
260
270
280
290
300
310
320
Temperature
MAPD = 1.89 %
MAPD = 0.55 %
MAPD = 79.95 %

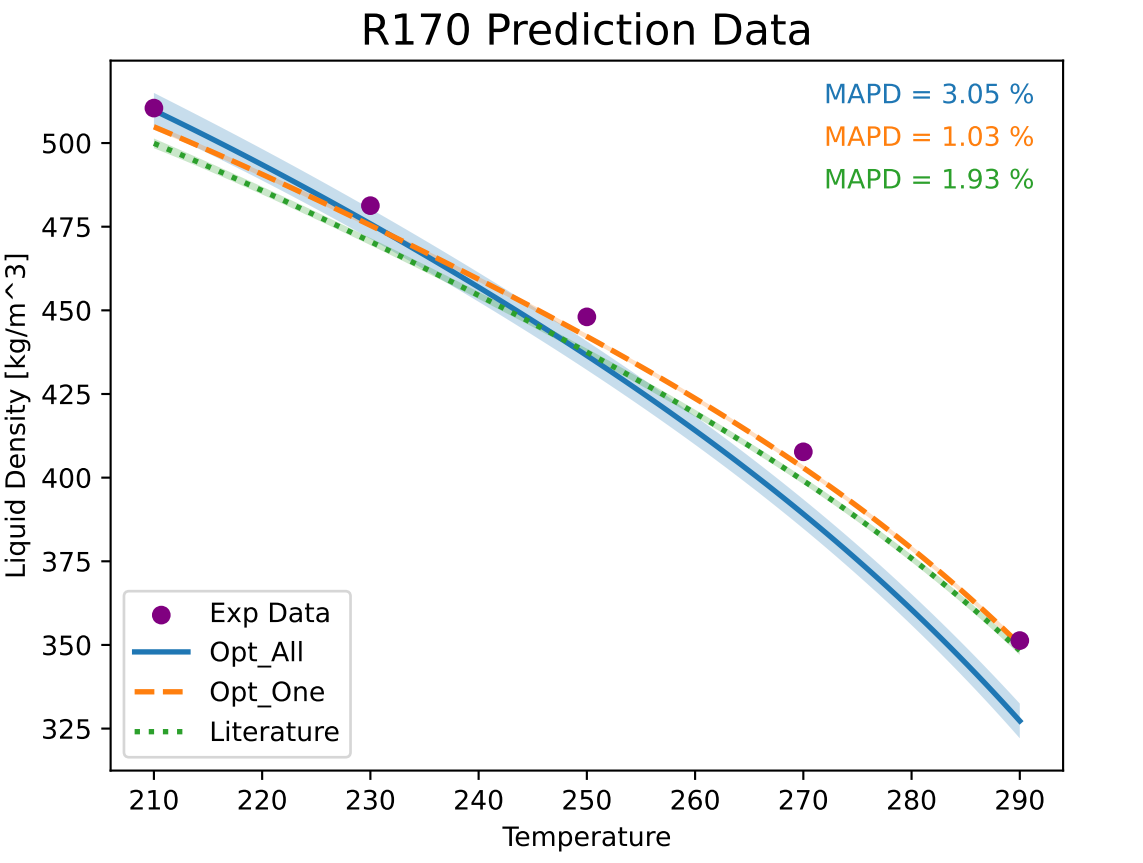

R32 Prediction Data
MAPD = 22.21 %
MAPD = 0.58 %
MAPD = 0.07 %
Exp Data
Opt_All
Opt_One
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
350
300
250
200
150
240
250
260
270
280
290
300
310
320

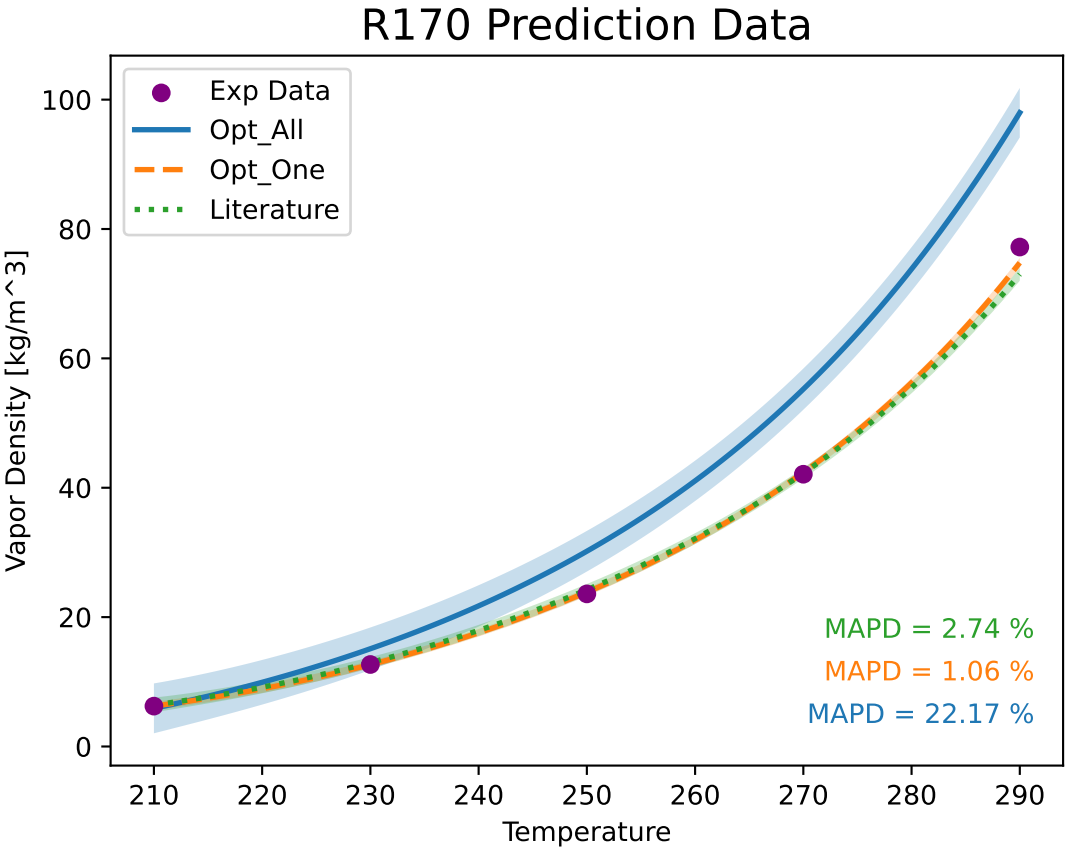

R50 Prediction Data
MAPD = 11.00 %
MAPD = 1.08 %
MAPD = 3.33 %
Liquid Density [kg/m^3]
Temperature
Exp Data
Opt_All
Opt_One
Literature
440
420
400
380
360
340
320
300
130
135
140
145
150
155
160
165
170

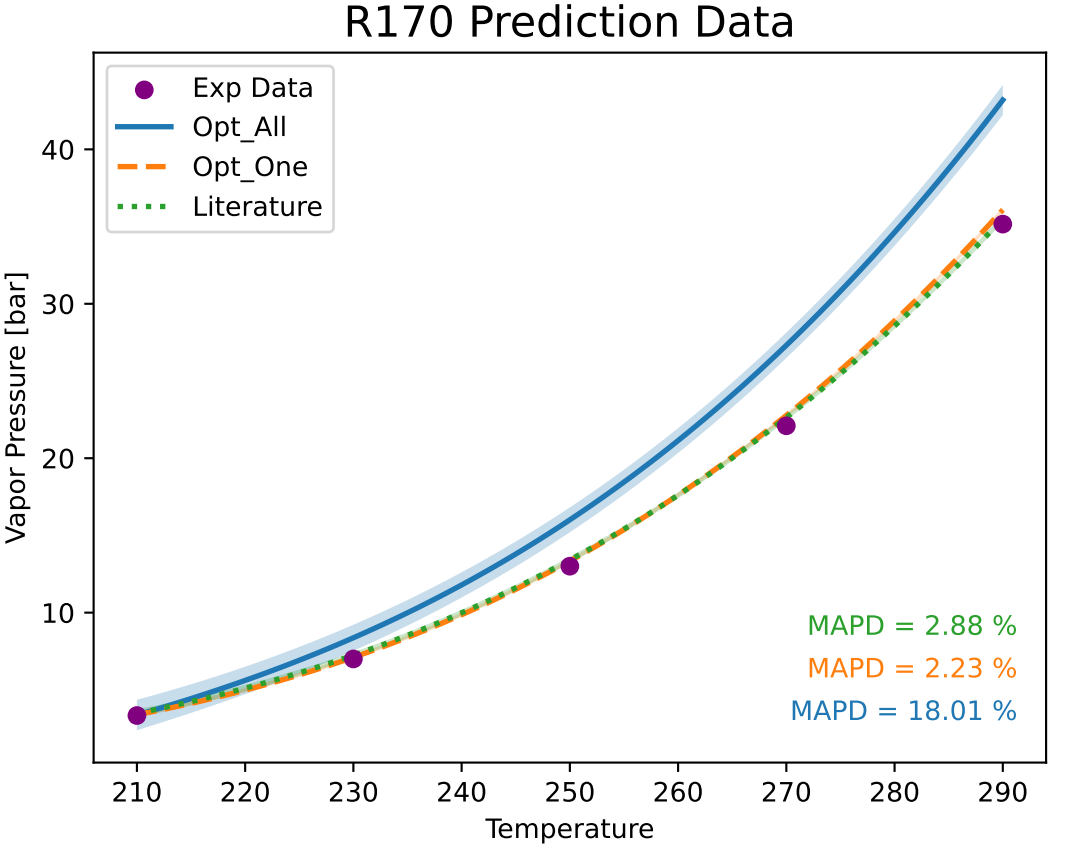

R50 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 0.78 %
MAPD = 0.31 %
MAPD = 14.80 %
0
5
10
15
20
25
30
35
40
130
135
140
145
150
155
160
165
170

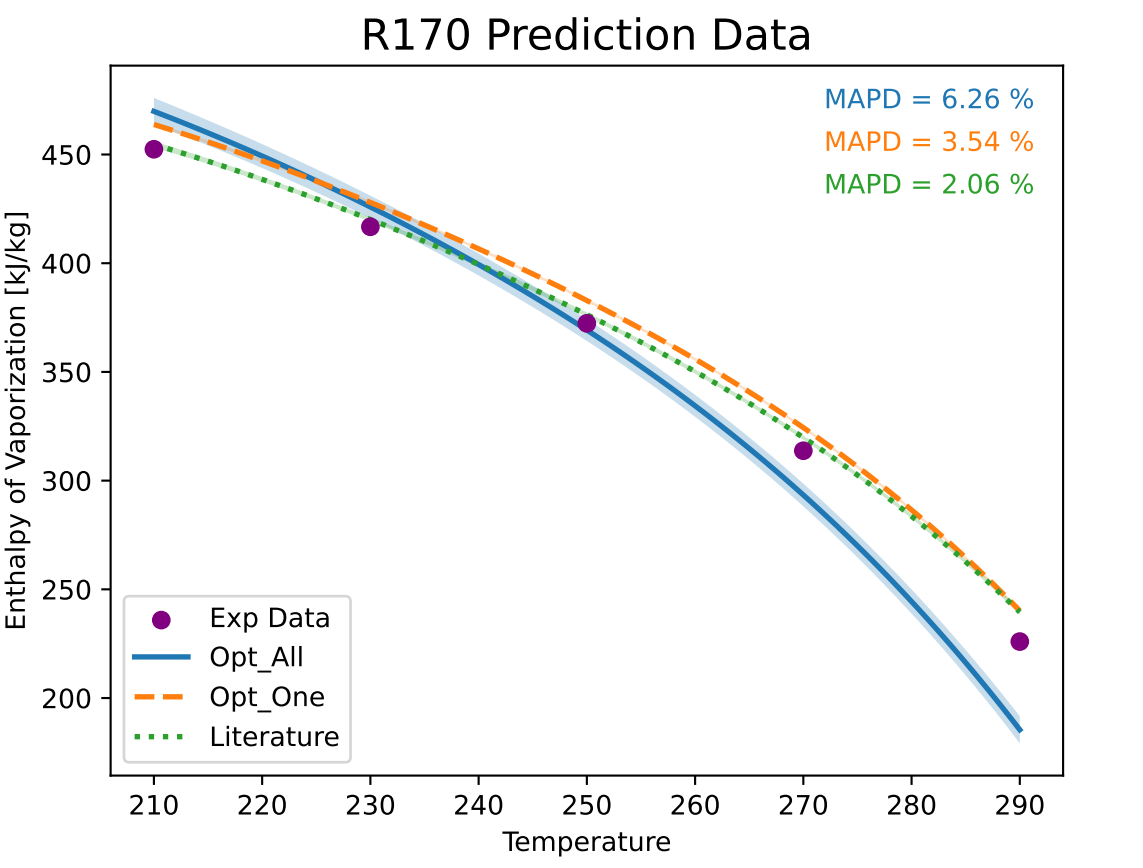

R50 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
Temperature
25
20
15
10
5
130
135
140
145
150
155
160
165
170
MAPD = 2.09 %
MAPD = 1.76 %
MAPD = 10.07 %

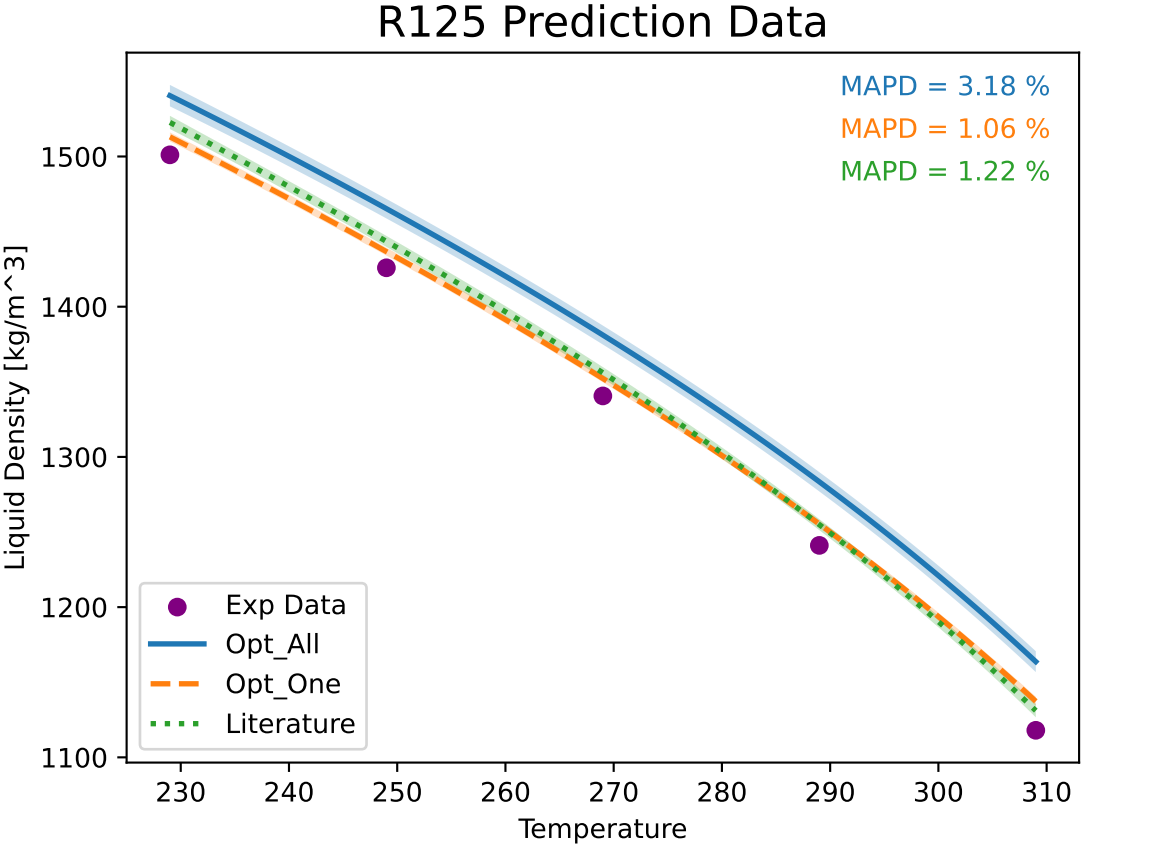

R50 Prediction Data
MAPD = 17.70 %
MAPD = 3.36 %
MAPD = 2.78 %
Exp Data
Opt_All
Opt_One
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
550
500
450
400
350
130
135
140
145
150
155
160
165
170

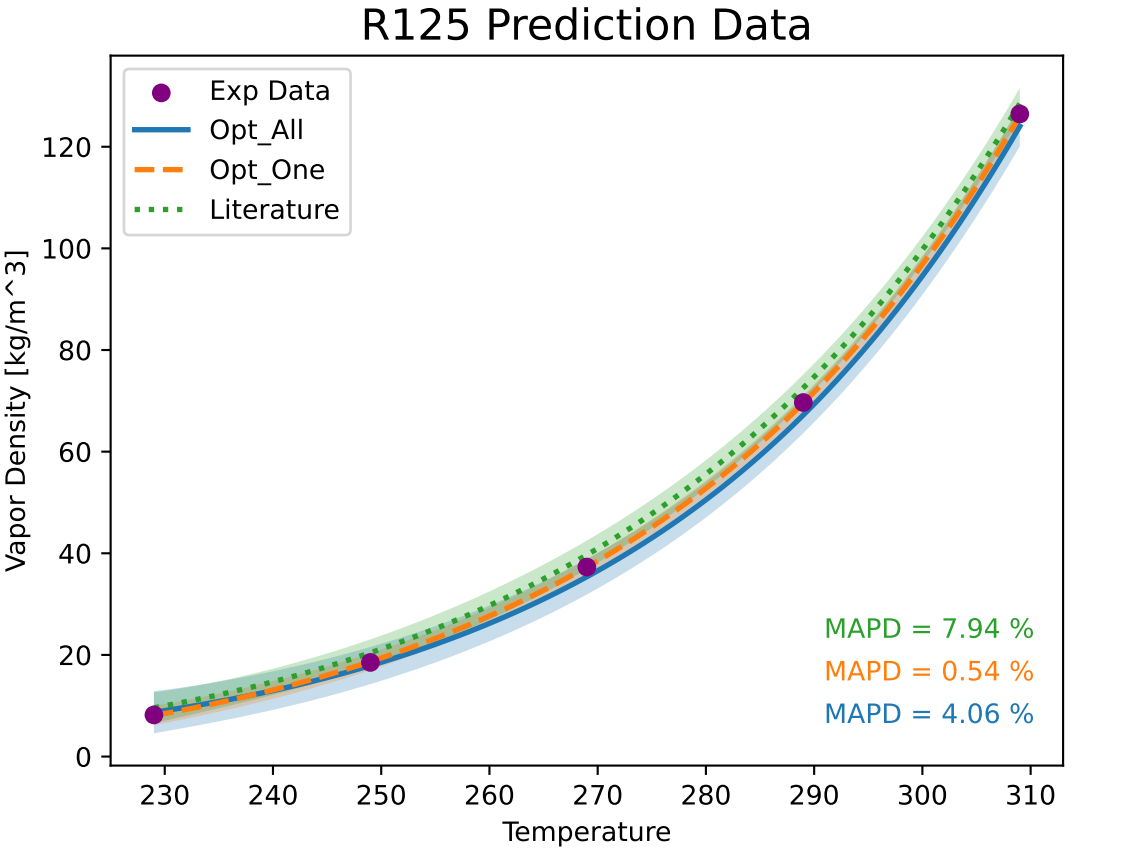

R170 Prediction Data
MAPD = 3.05 %
MAPD = 1.03 %
MAPD = 1.93 %
Liquid Density [kg/m^3]
500
475
450
425
400
375
350
325
210
220
230
240
250
260
270
280
290
Temperature
Exp Data
Opt_All
Opt_One
Literature

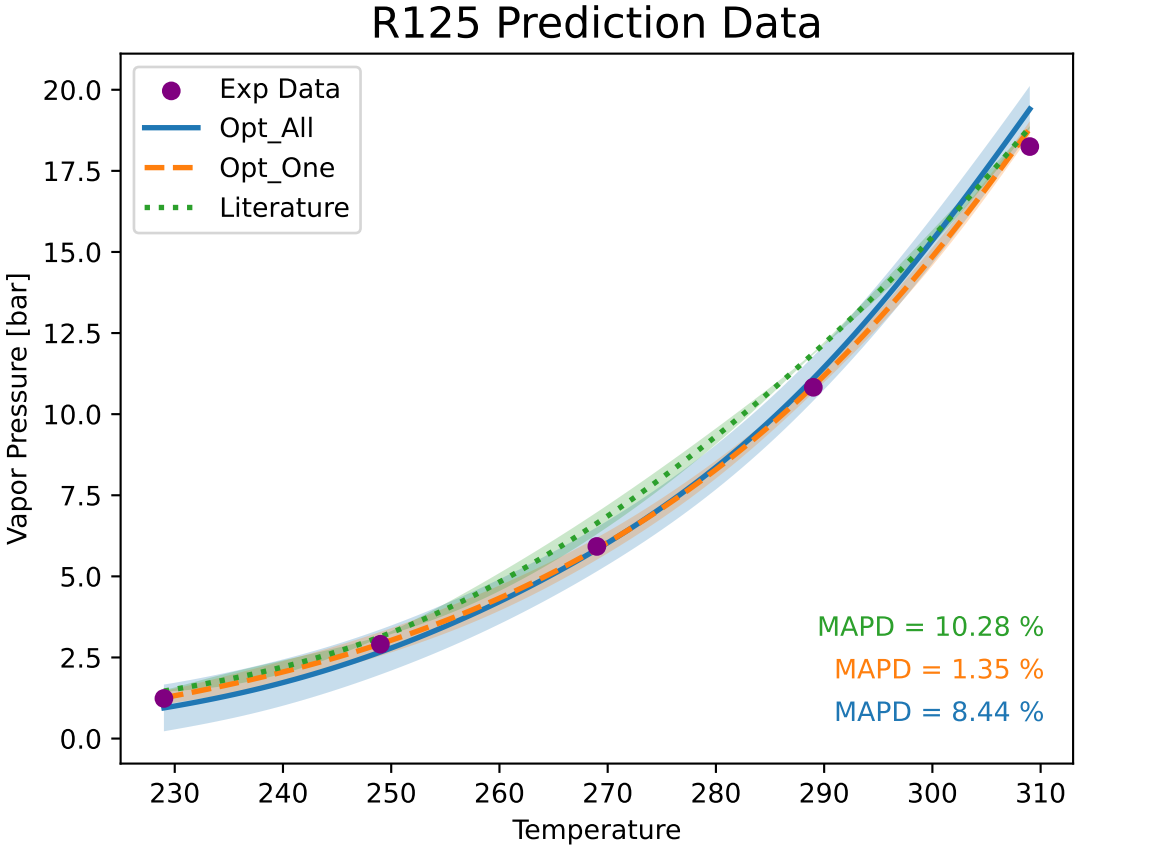

R170 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 2.74 %
MAPD = 1.06 %
MAPD = 22.17 %
0
20
40
60
80
100
210
220
230
240
250
260
270
280
290

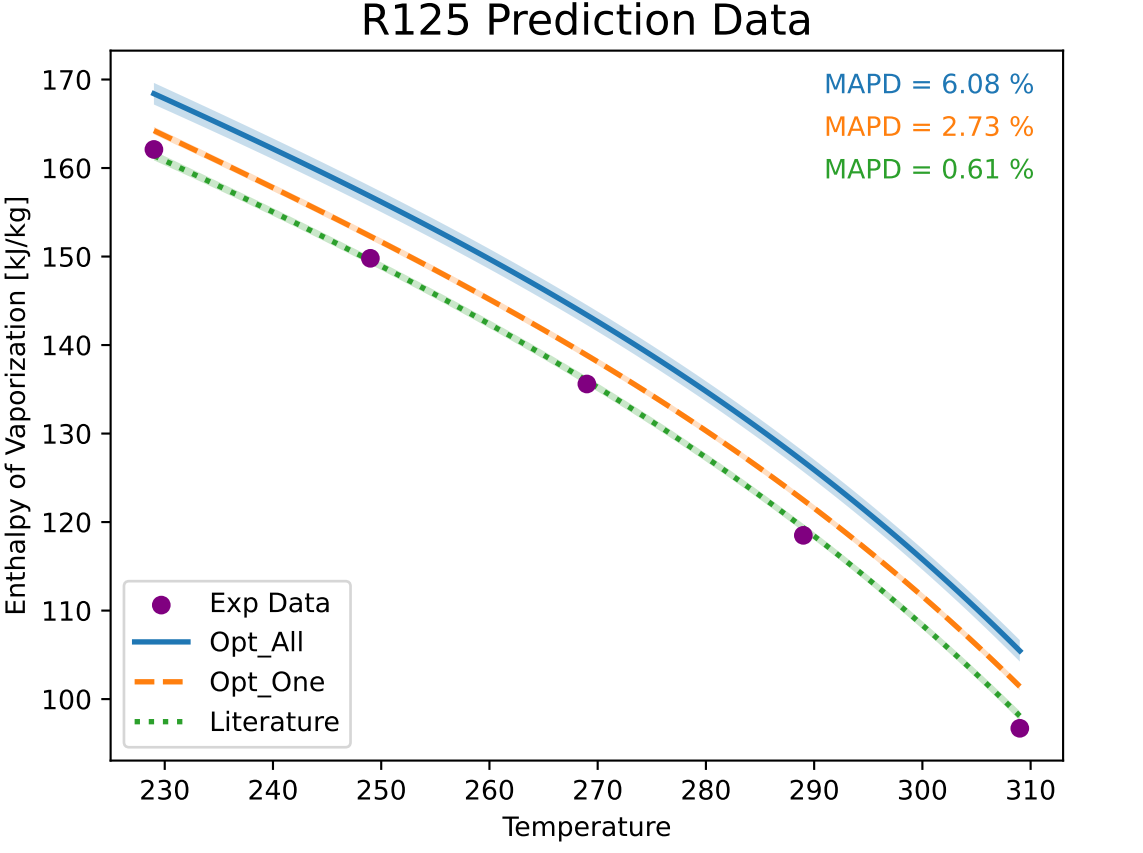

R170 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
10
20
30
40
210
220
230
240
250
260
270
280
290
Temperature
MAPD = 2.88 %
MAPD = 2.23 %
MAPD = 18.01 %

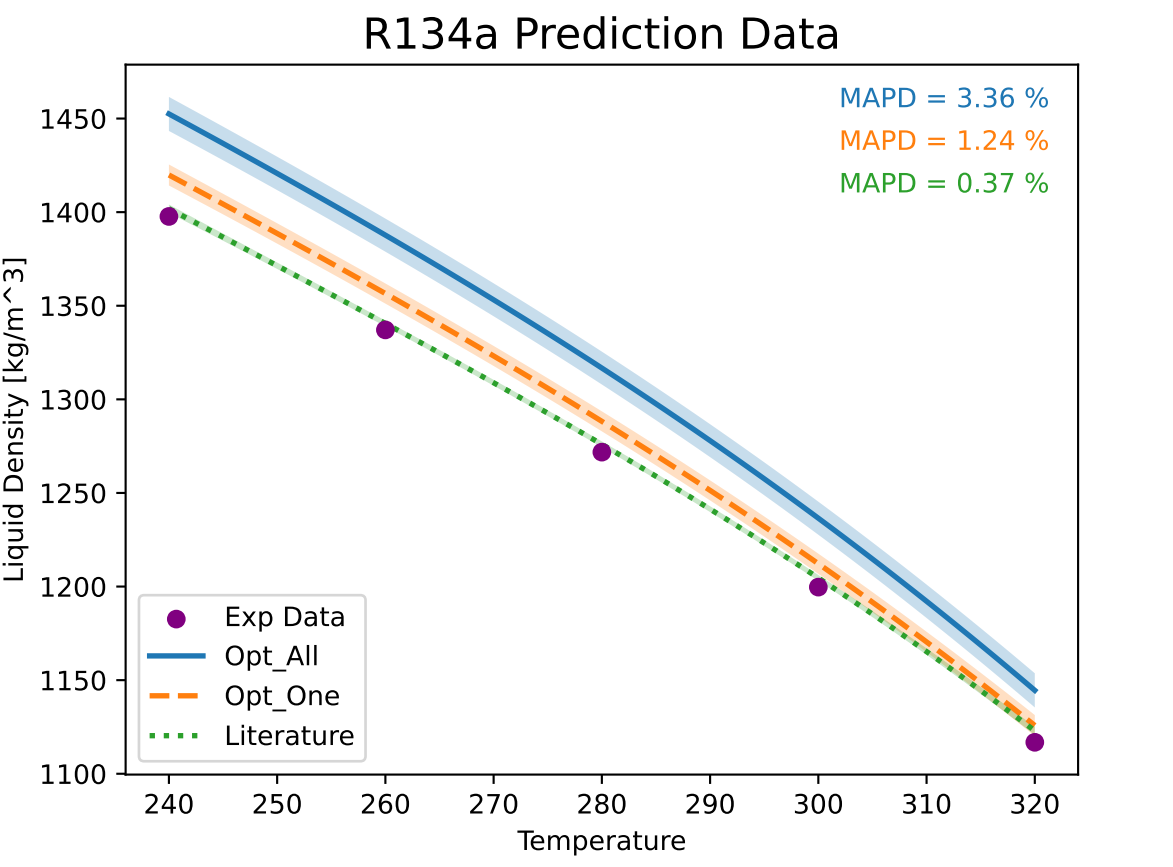

R170 Prediction Data
MAPD = 6.26 %
MAPD = 3.54 %
MAPD = 2.06 %
Enthalpy of Vaporization [kJ/kg]
Temperature
Exp Data
Opt_All
Opt_One
Literature
450
400
350
300
250
200
210
220
230
240
250
260
270
280
290

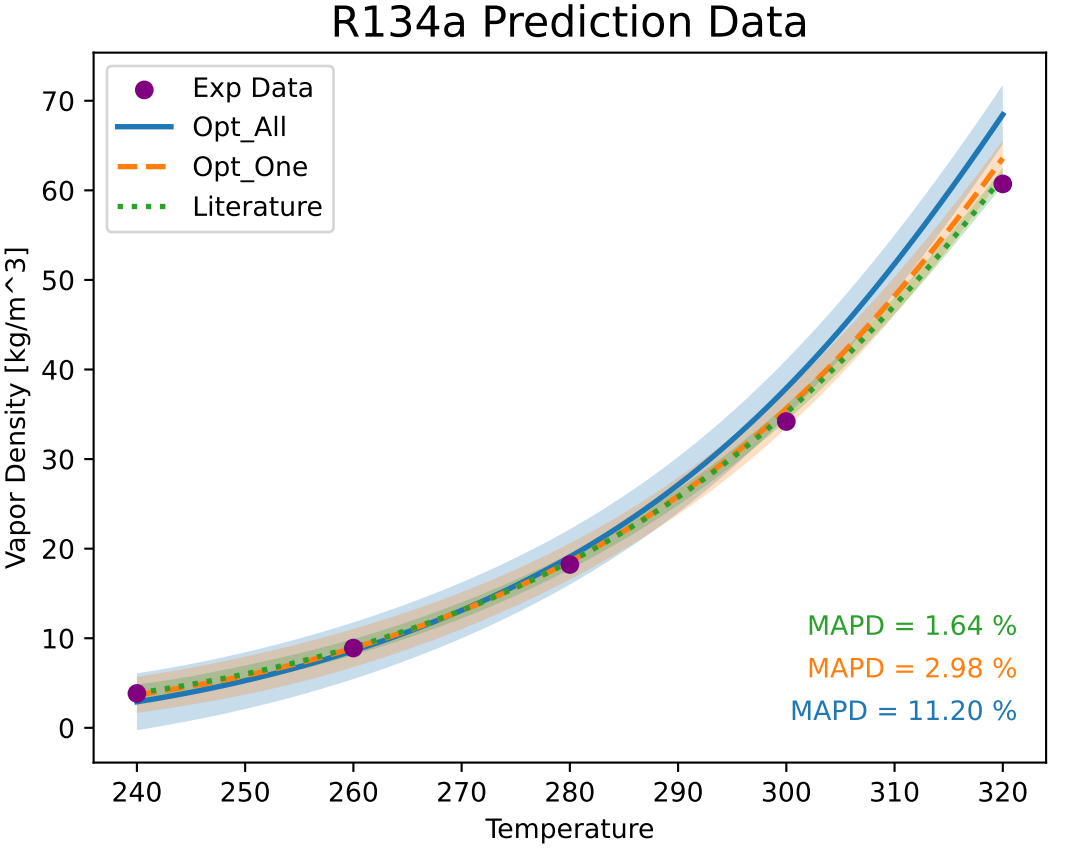

R125 Prediction Data
MAPD = 3.18 %
MAPD = 1.06 %
MAPD = 1.22 %
Liquid Density [kg/m^3]
1500
1400
1300
1200
1100
230
240
250
260
270
280
290
300
310
Temperature
Exp Data
Opt_All
Opt_One
Literature

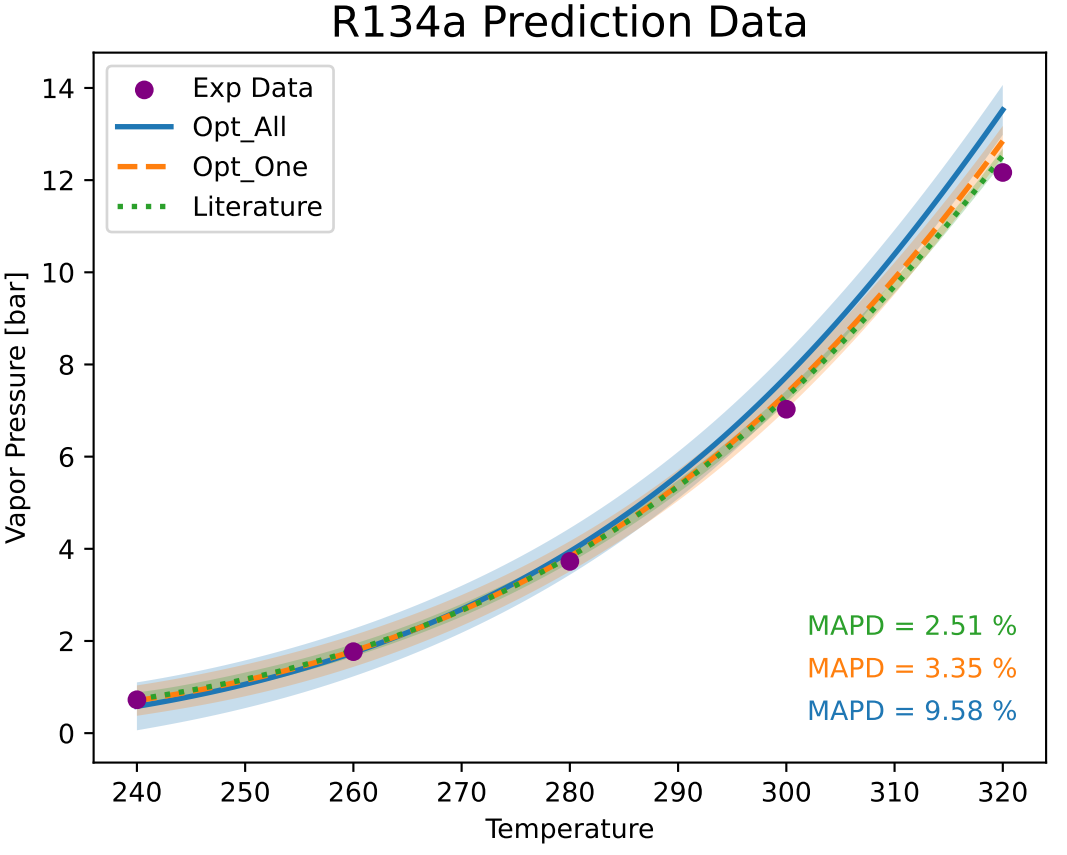

R125 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
Temperature
0
20
40
60
80
100
120
230
240
250
260
270
280
290
300
310
MAPD = 7.94 %
MAPD = 0.54 %
MAPD = 4.06 %

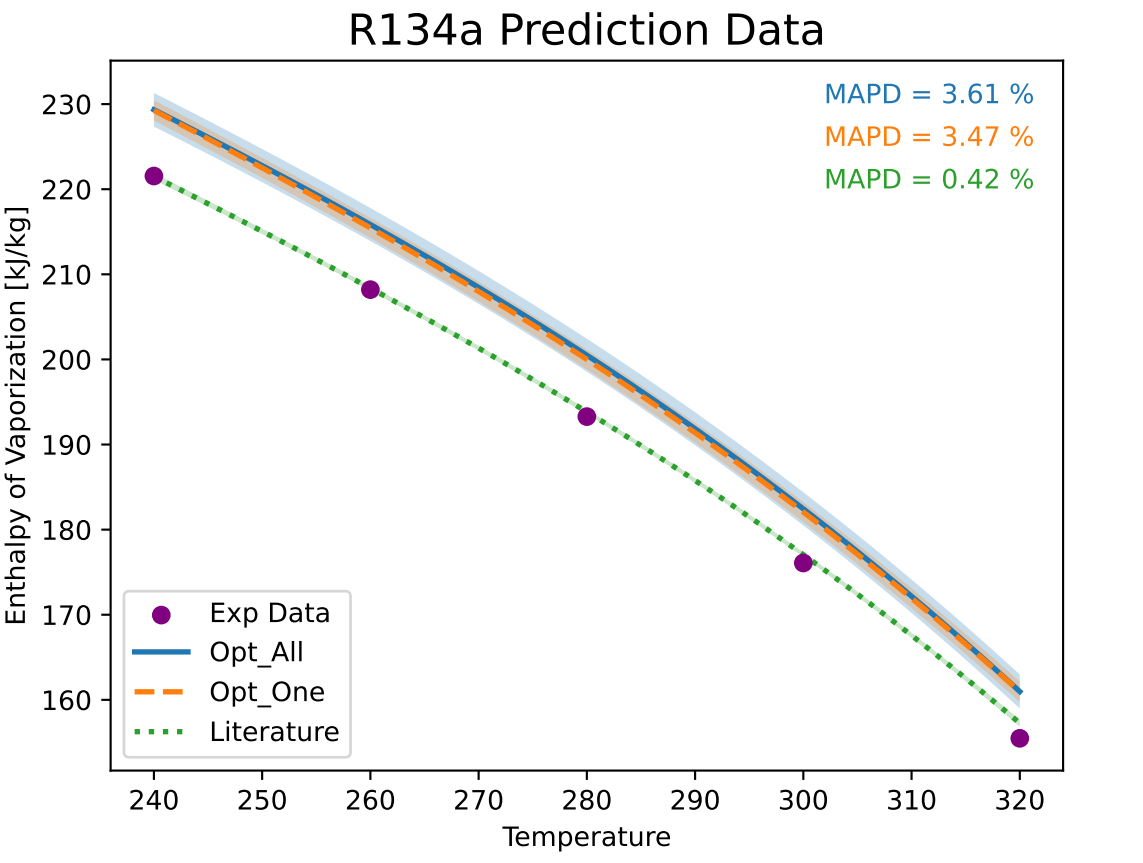

R125 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
Temperature
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
230
240
250
260
270
280
290
300
310
MAPD = 10.28 %
MAPD = 1.35 %
MAPD = 8.44 %

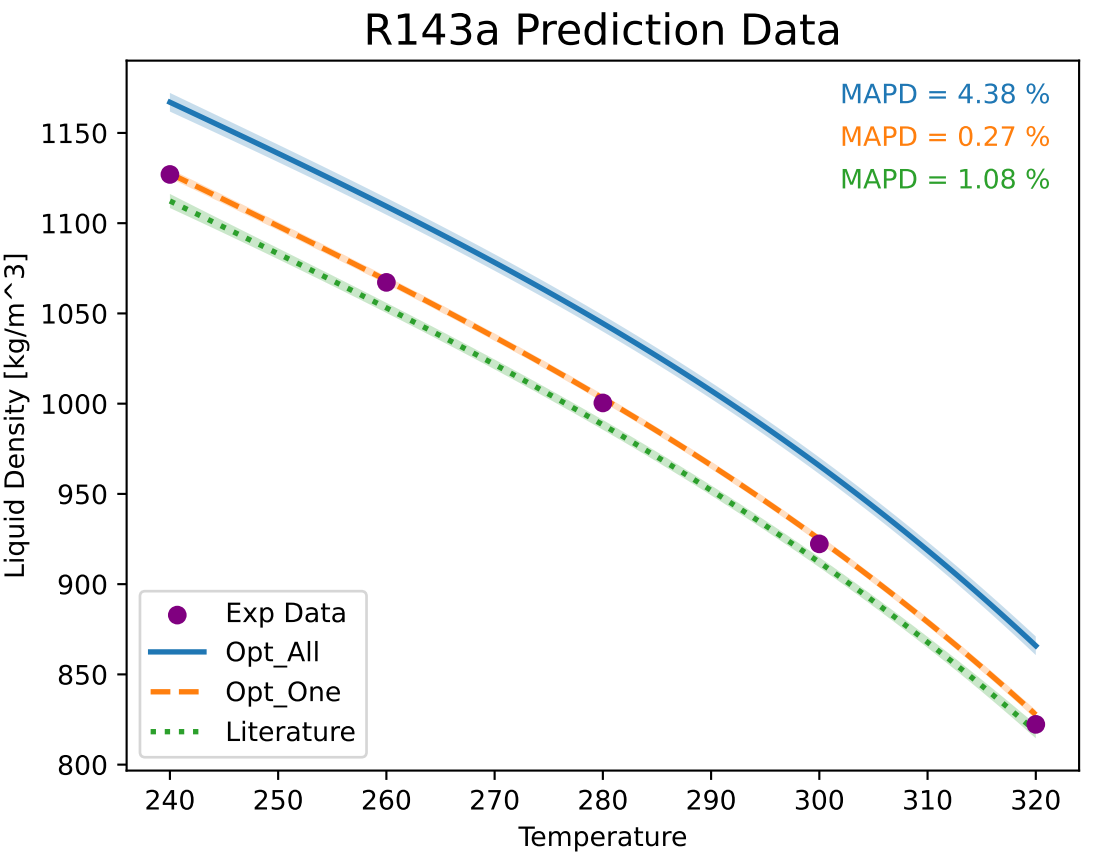

R125 Prediction Data
MAPD = 6.08 %
MAPD = 2.73 %
MAPD = 0.61 %
Exp Data
Opt_All
Opt_One
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
170
160
150
140
130
120
110
100
230
240
250
260
270
280
290
300
310

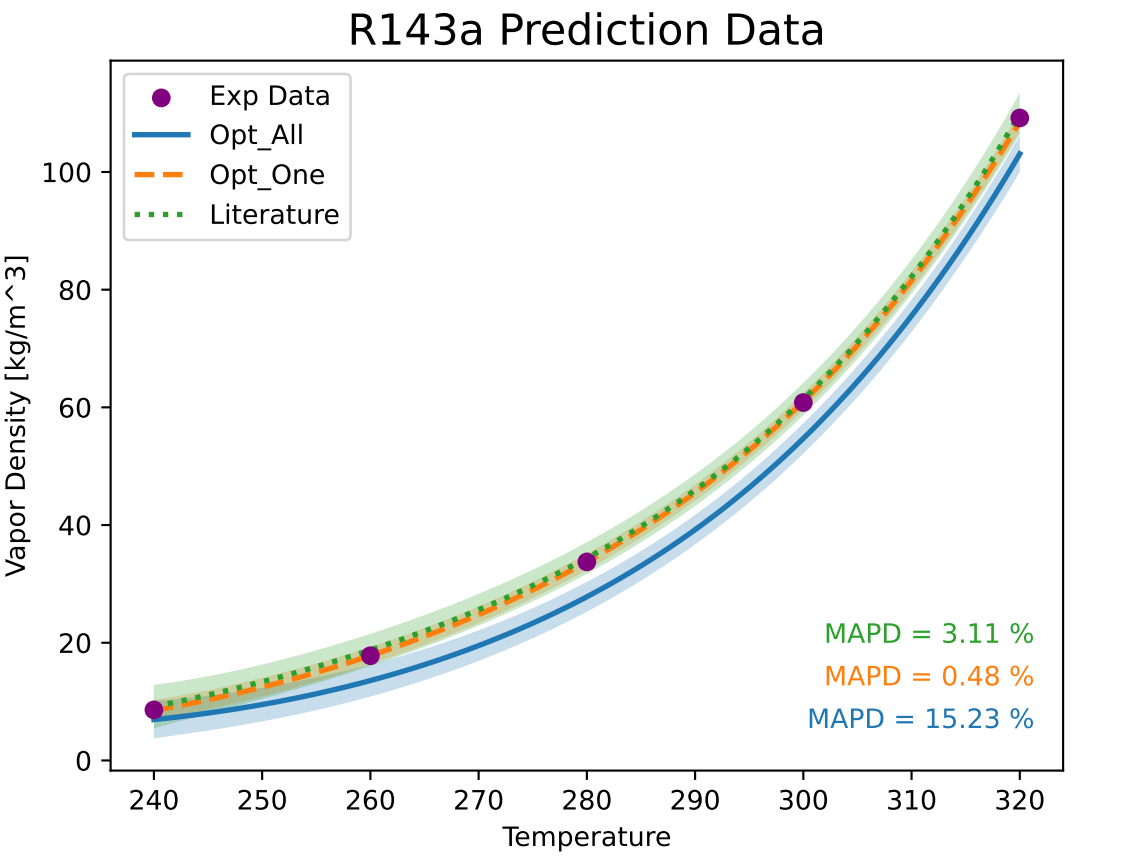

R134a Prediction Data
MAPD = 3.36 %
MAPD = 1.24 %
MAPD = 0.37 %
Liquid Density [kg/m^3]
Temperature
1450
1400
1350
1300
1250
1200
1150
1100
240
250
260
270
280
290
300
310
320
Exp Data
Opt_All
Opt_One
Literature

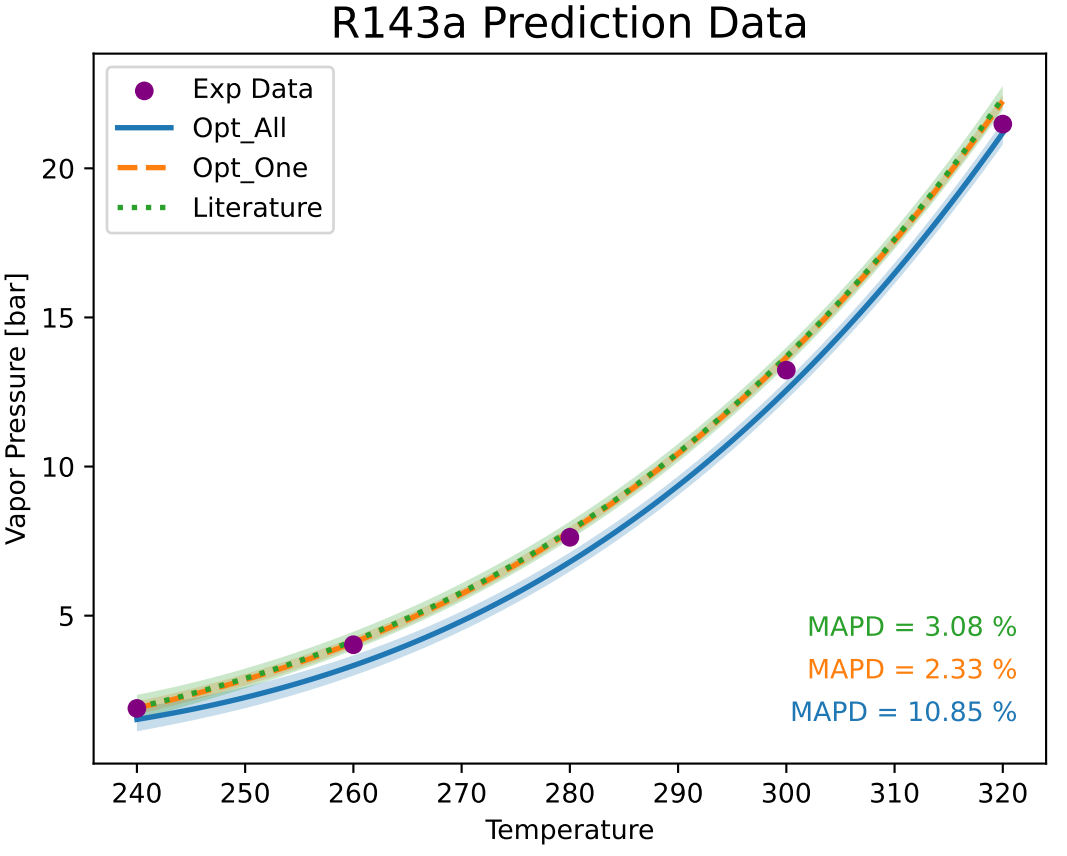

R134a Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
Temperature
MAPD = 1.64 %
MAPD = 2.98 %
MAPD = 11.20 %
0
10
20
30
40
50
60
70
240
250
260
270
280
290
300
310
320

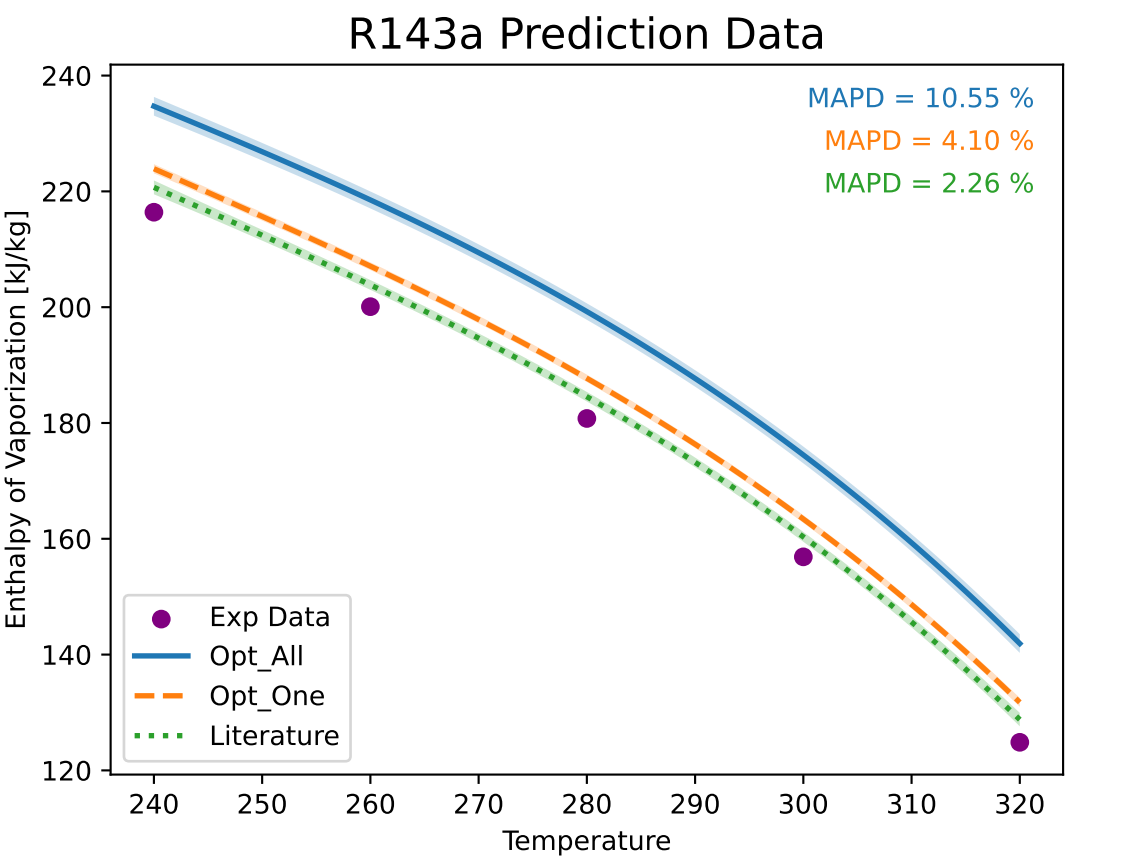

R134a Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
Temperature
0
2
4
6
8
10
12
14
240
250
260
270
280
290
300
310
320
MAPD = 2.51 %
MAPD = 3.35 %
MAPD = 9.58 %

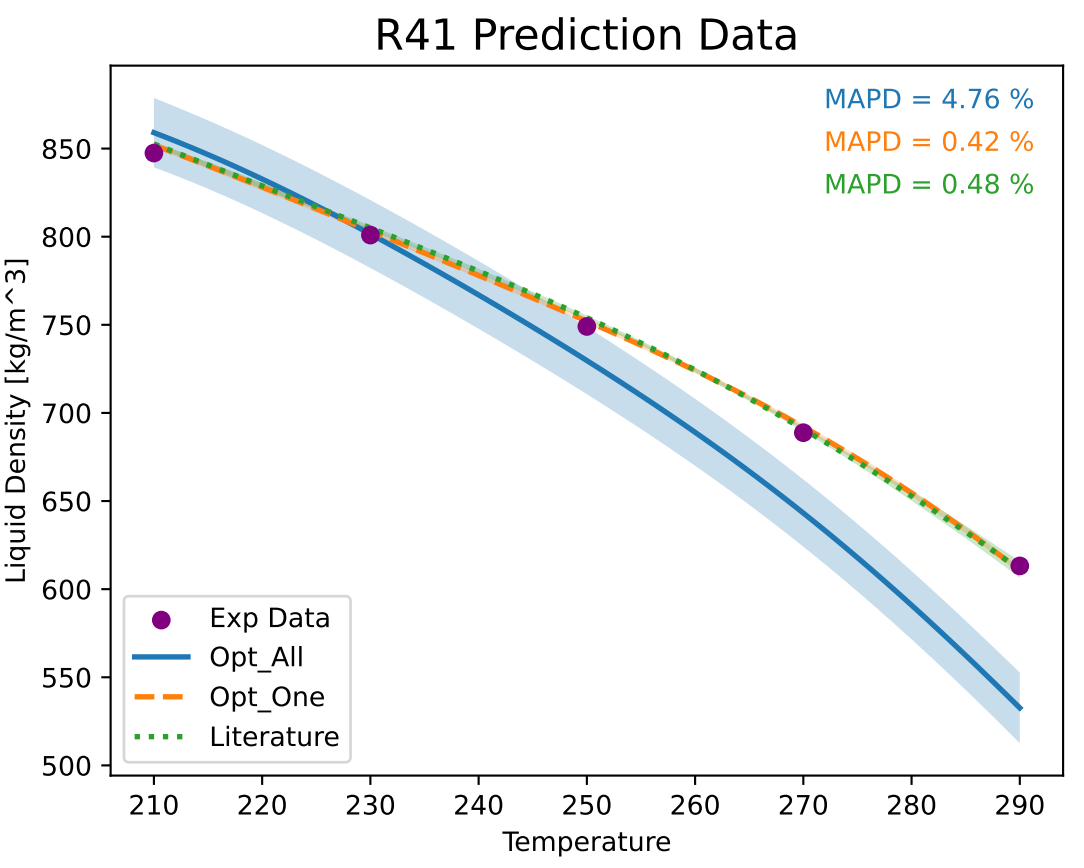

R134a Prediction Data
MAPD = 3.61 %
MAPD = 3.47 %
MAPD = 0.42 %
Enthalpy of Vaporization [kJ/kg]
Temperature
230
220
210
200
190
180
170
160
240
250
260
270
280
290
300
310
320
Exp Data
Opt_All
Opt_One
Literature

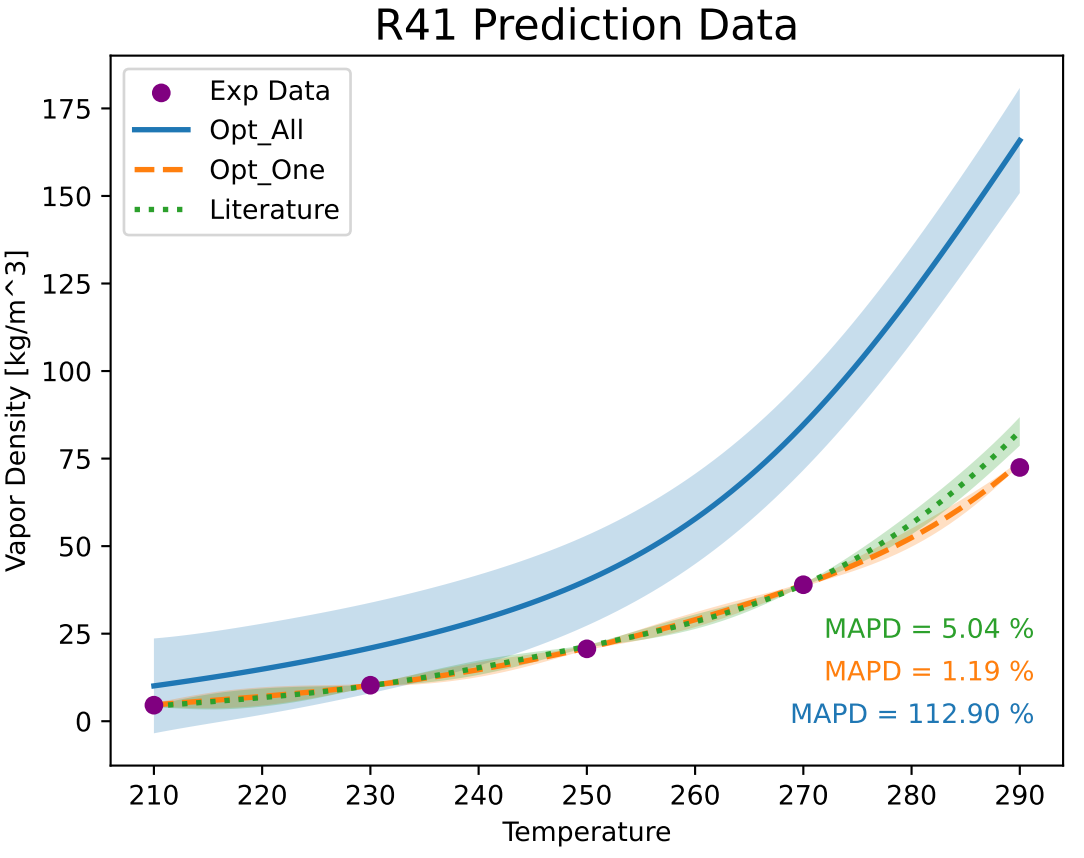

R143a Prediction Data
MAPD = 4.38 %
MAPD = 0.27 %
MAPD = 1.08 %
Liquid Density [kg/m^3]
Temperature
Exp Data
Opt_All
Opt_One
Literature
1150
1100
1050
1000
950
900
850
800
240
250
260
270
280
290
300
310
320

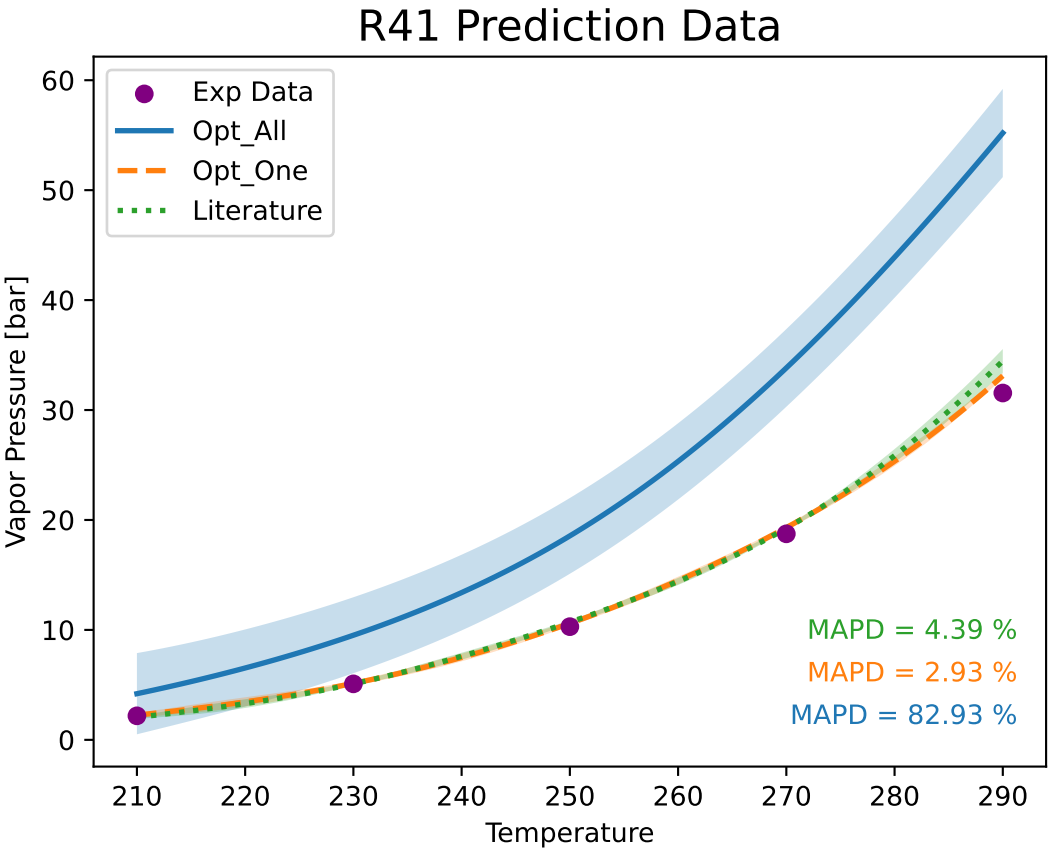

R143a Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Density [kg/m^3]
0
20
40
60
80
100
240
250
260
270
280
290
300
310
320
Temperature
MAPD = 3.11 %
MAPD = 0.48 %
MAPD = 15.23 %

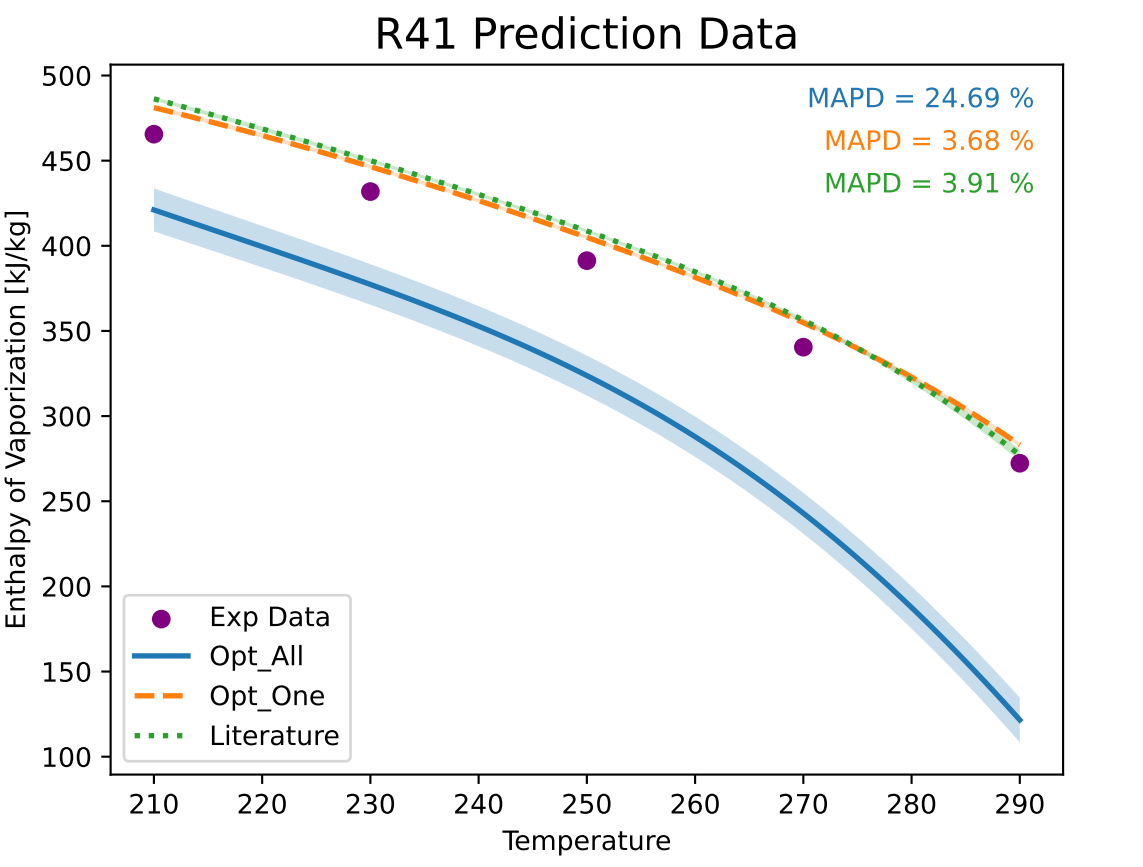

R143a Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
5
10
15
20
240
250
260
270
280
290
300
310
320
Temperature
MAPD = 3.08 %
MAPD = 2.33 %
MAPD = 10.85 %


R143a Prediction Data
MAPD = 10.55 %
MAPD = 4.10 %
MAPD = 2.26 %
Exp Data
Opt_All
Opt_One
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 = 4.76 %
MAPD = 0.42 %
MAPD = 0.48 %
Liquid Density [kg/m^3]
850
800
750
700
650
600
550
500
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]
175
150
125
100
75
50
25
0
210
220
230
240
250
260
270
280
290
Temperature
MAPD = 5.04 %
MAPD = 1.19 %
MAPD = 112.90 %


R41 Prediction Data
Exp Data
Opt_All
Opt_One
Literature
Vapor Pressure [bar]
Temperature
0
10
20
30
40
50
60
210
220
230
240
250
260
270
280
290
MAPD = 4.39 %
MAPD = 2.93 %
MAPD = 82.93 %


R41 Prediction Data
MAPD = 24.69 %
MAPD = 3.68 %
MAPD = 3.91 %
Exp Data
Opt_All
Opt_One
Literature
Enthalpy of Vaporization [kJ/kg]
Temperature
500
450
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