

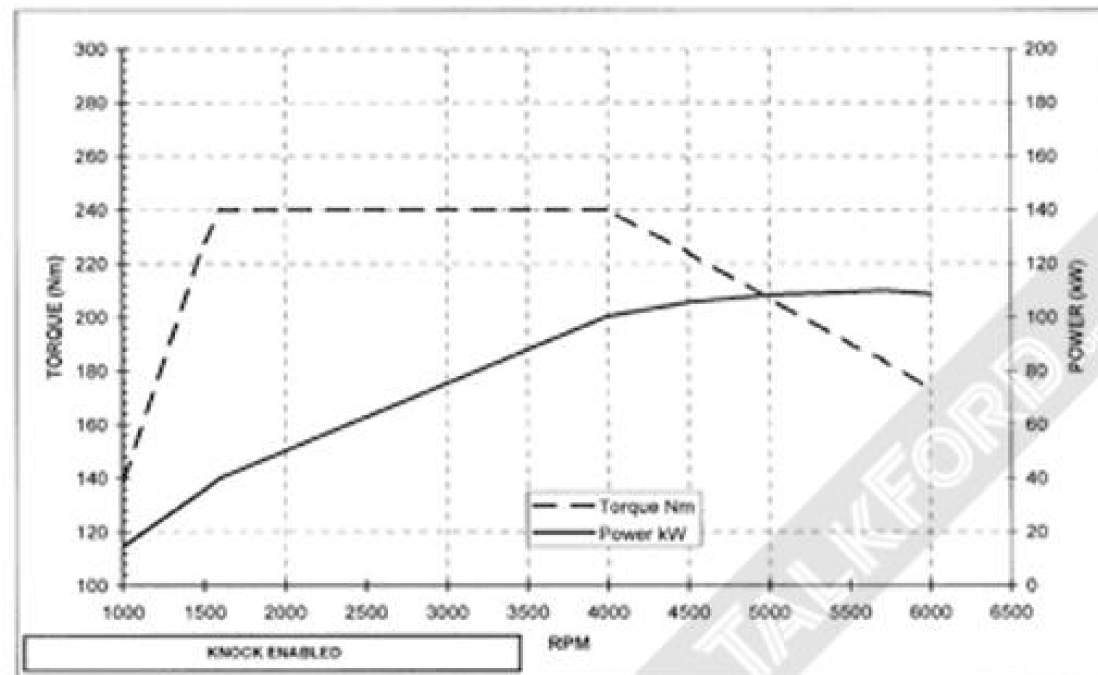
2013 Ford 1.6L EcoBoost LEV III Fuel - Test Data Plots

SUGGESTED CITATION: 2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Package. Version 2018-10. Ann Arbor, MI: US EPA, National Vehicle and Fuel Emissions Laboratory, National Center for Advanced Technology, 2018.

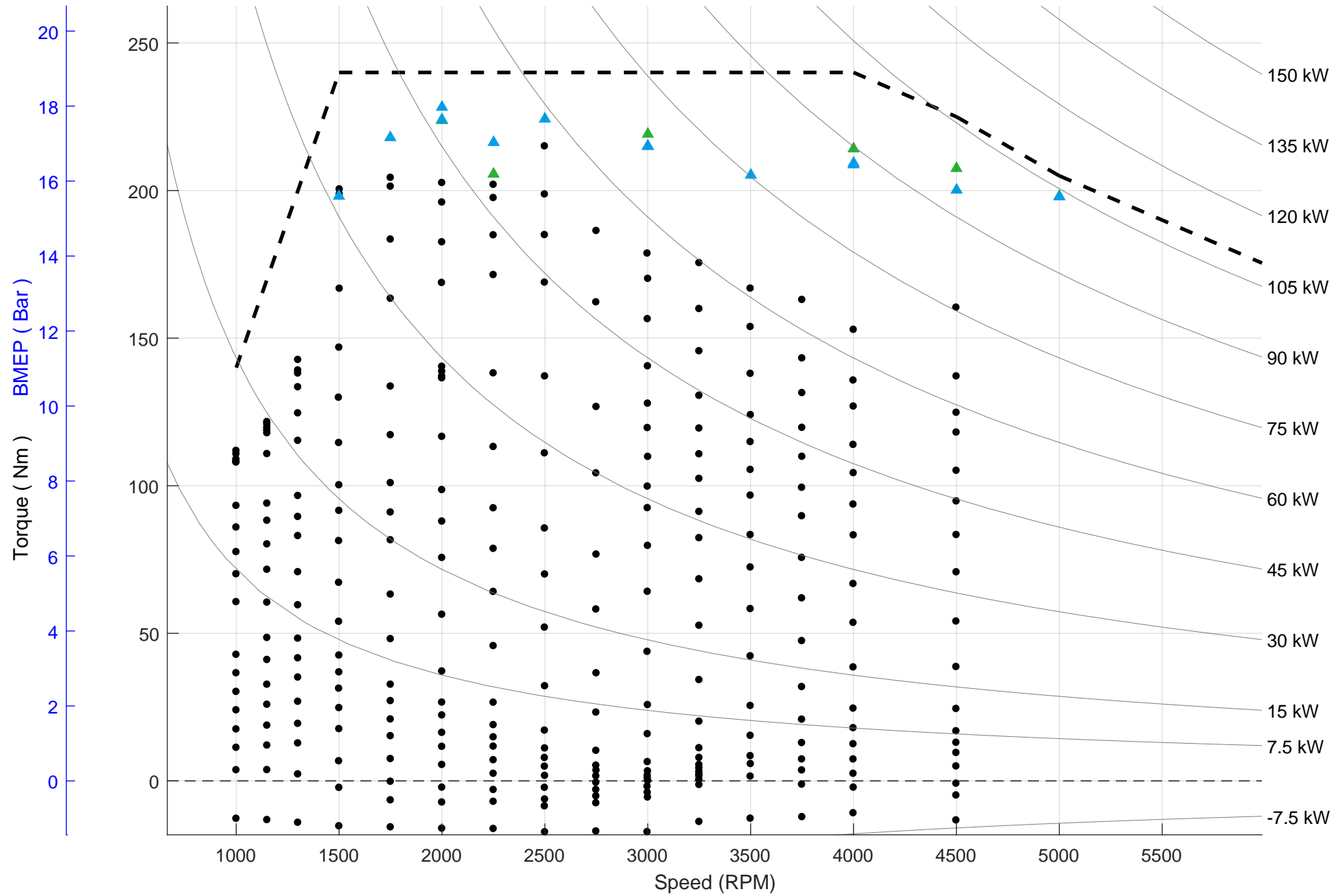
- — Dashed line indicates the maximum torque curve from published data
- Black dots indicate speed/load points at which steady state data was acquired
- ▲ Blue triangles indicate speed/load points at which initial data from the transient high load method was acquired
- ▲ Green triangles indicate speed/load points at which final data from the transient high load method was acquired
- ✗ Red Xs indicate speed/load points where data was not collected or did not meet quality standards

Note: In these contour plots, individual data points may be ignored or removed, using our best engineering judgment, to correct irregularities in the visual presentation of the contour lines; additional details are contained in the test report.

Published maximum torque data from:

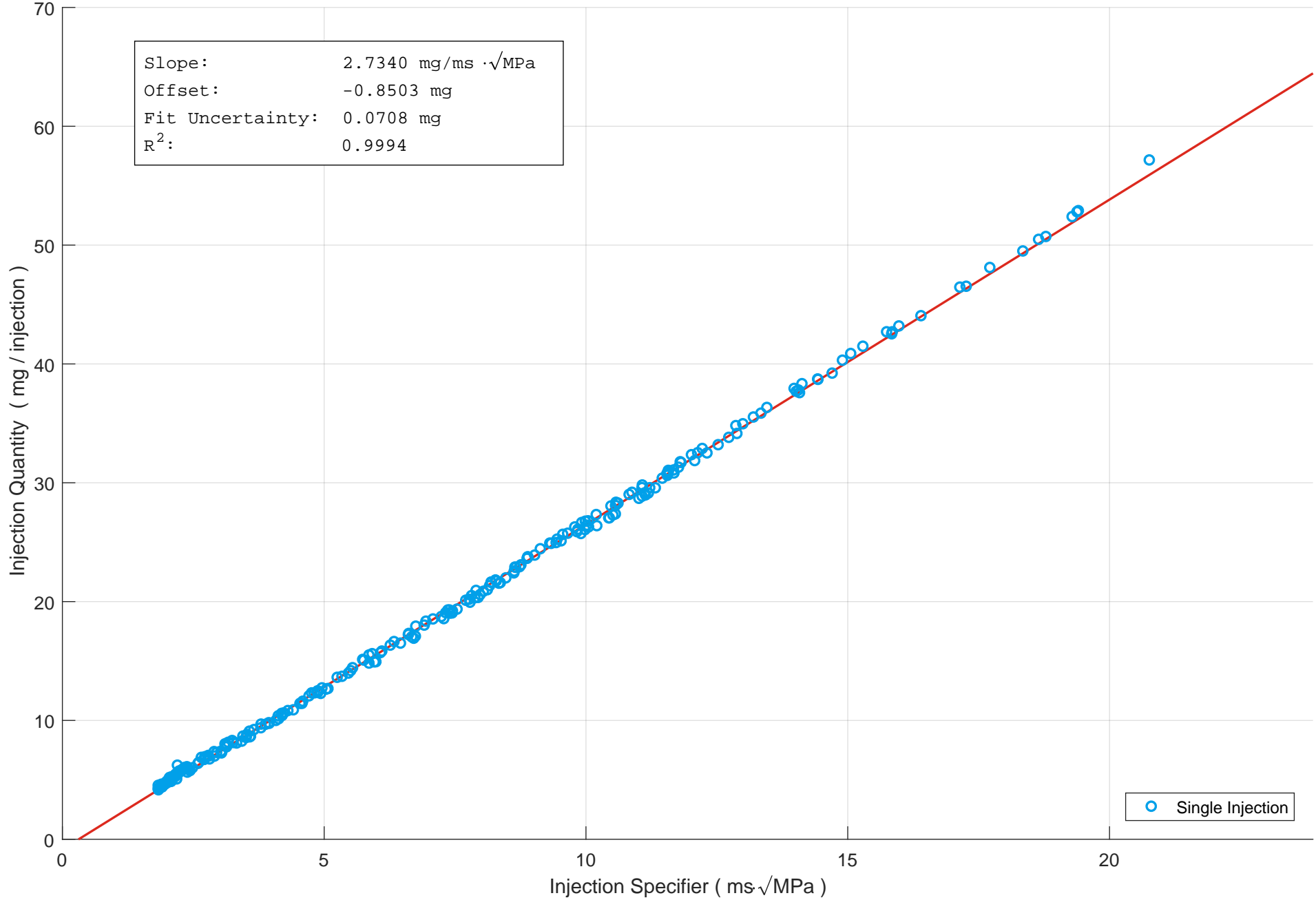


2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Test Data Points

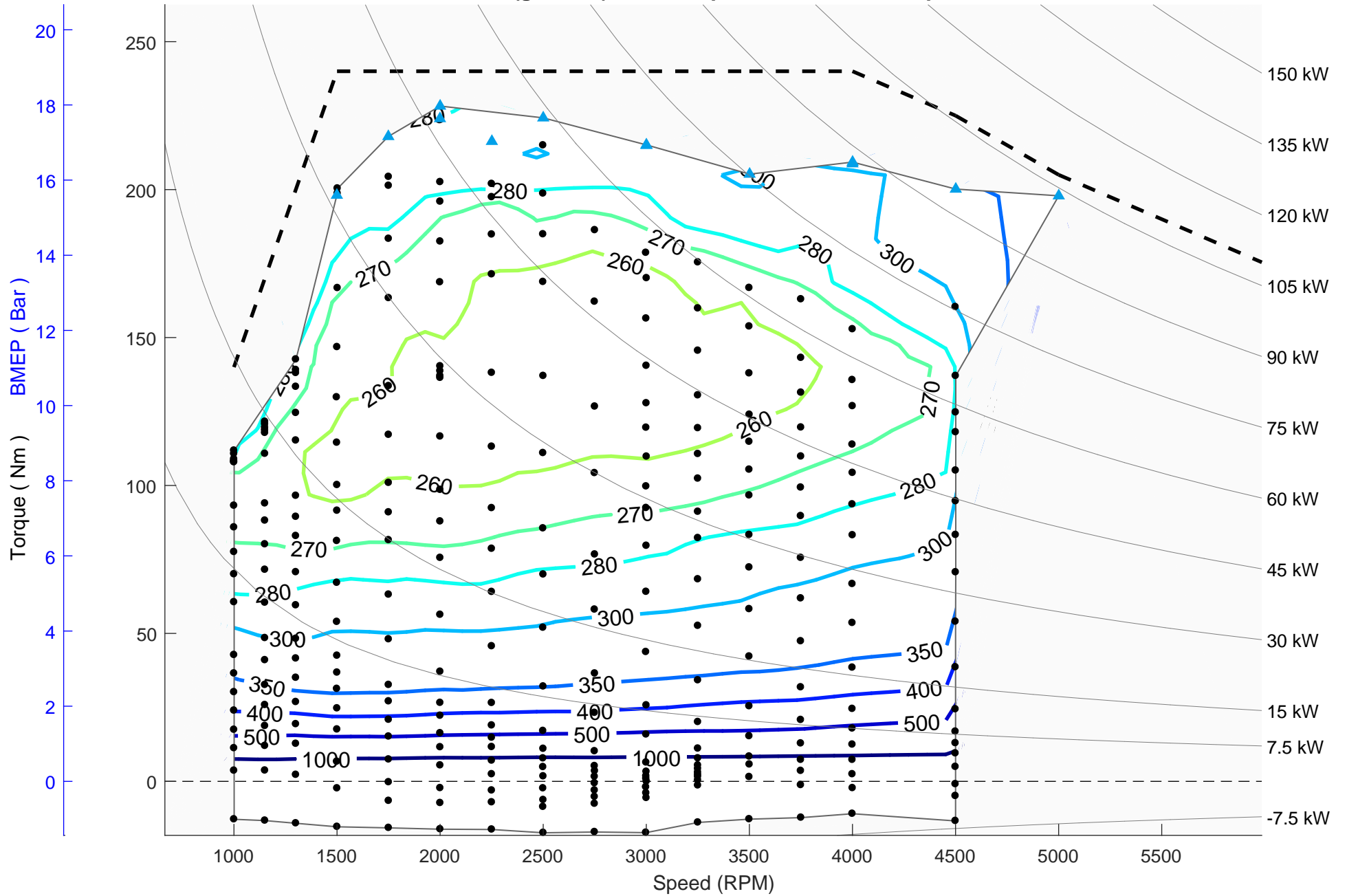


2013 Ford 1.6L EcoBoost LEV III Fuel - Test Data Plots

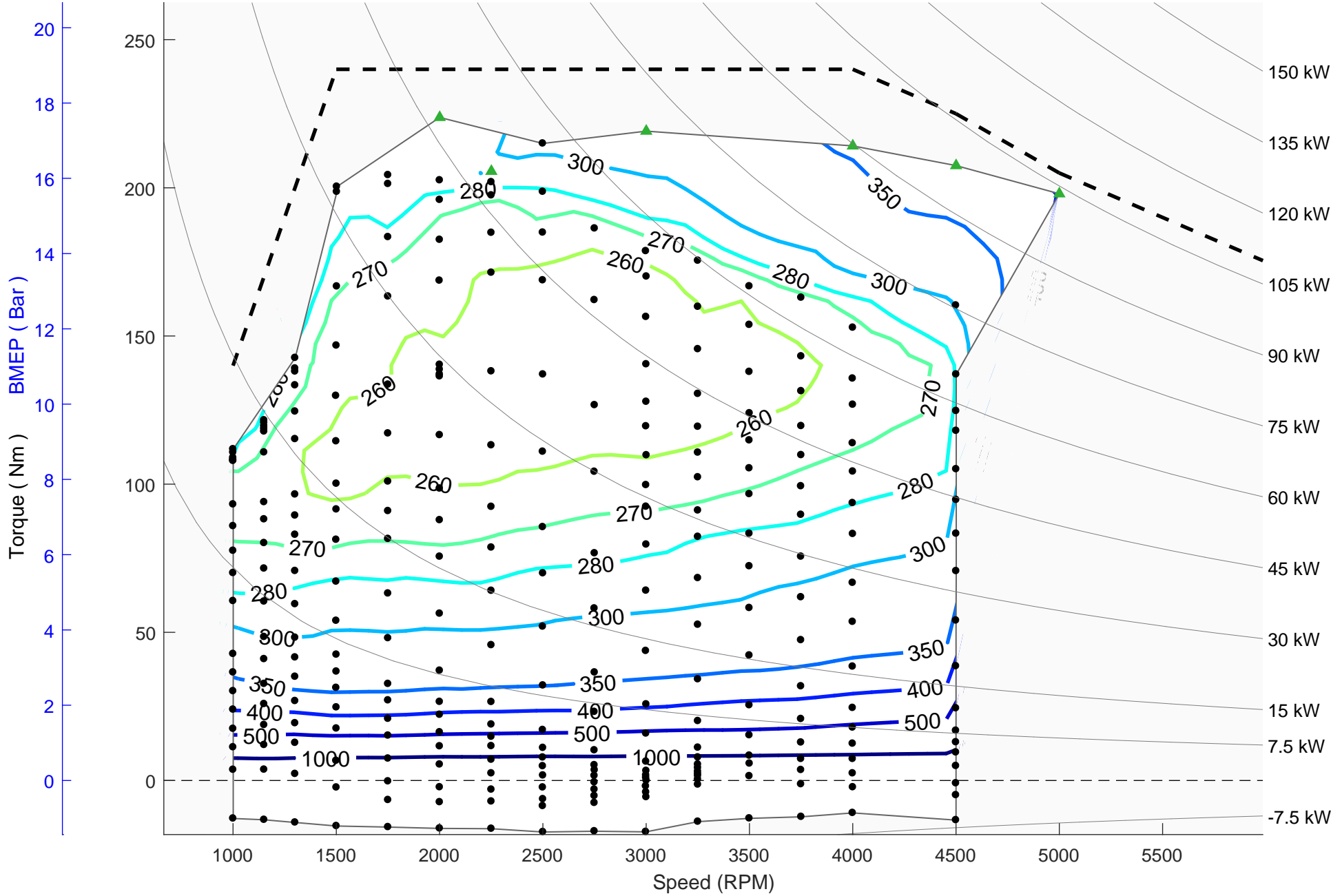
Injector Calibration



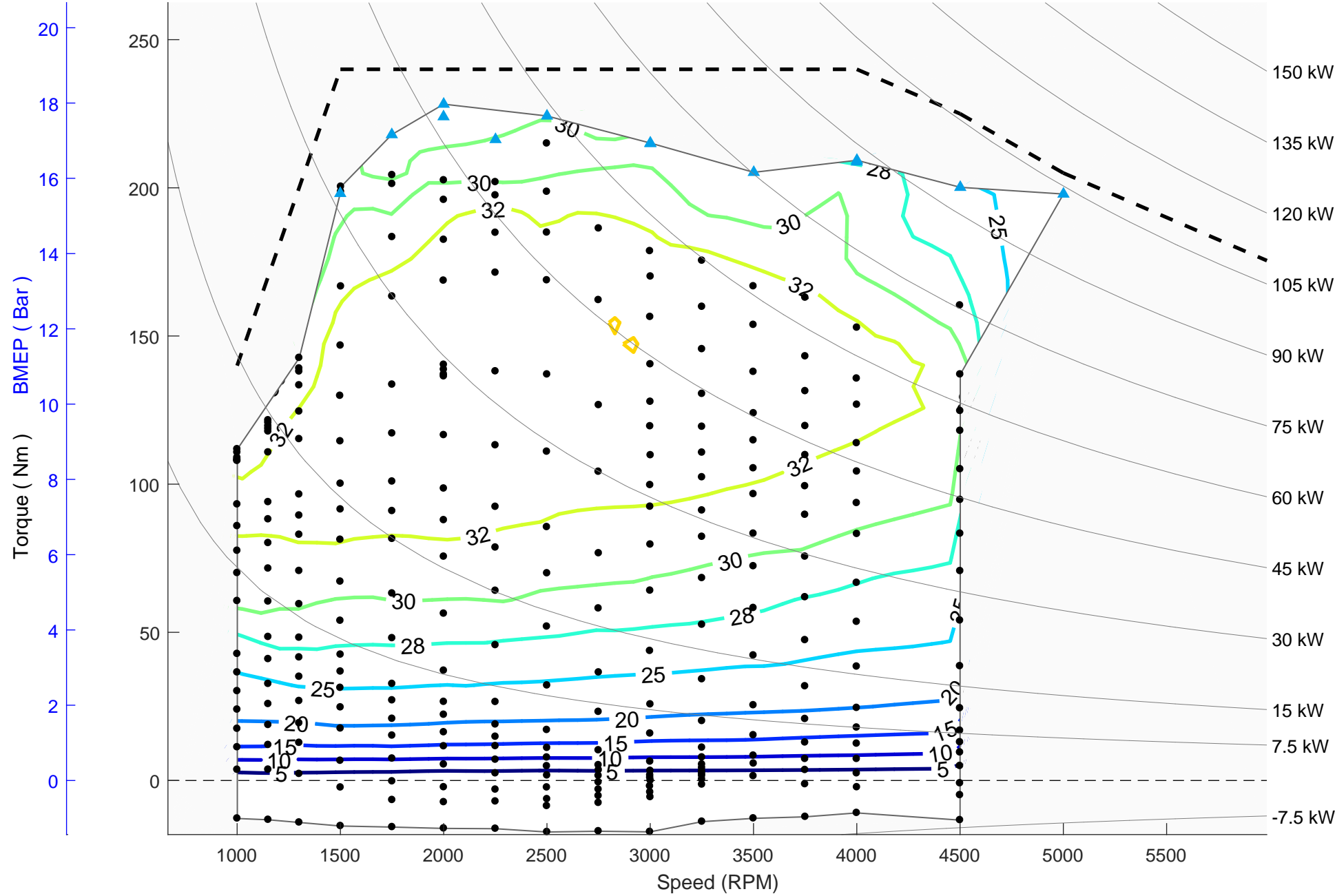
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
BSFC (g/kW-hr) - Brake Specific Fuel Consumption



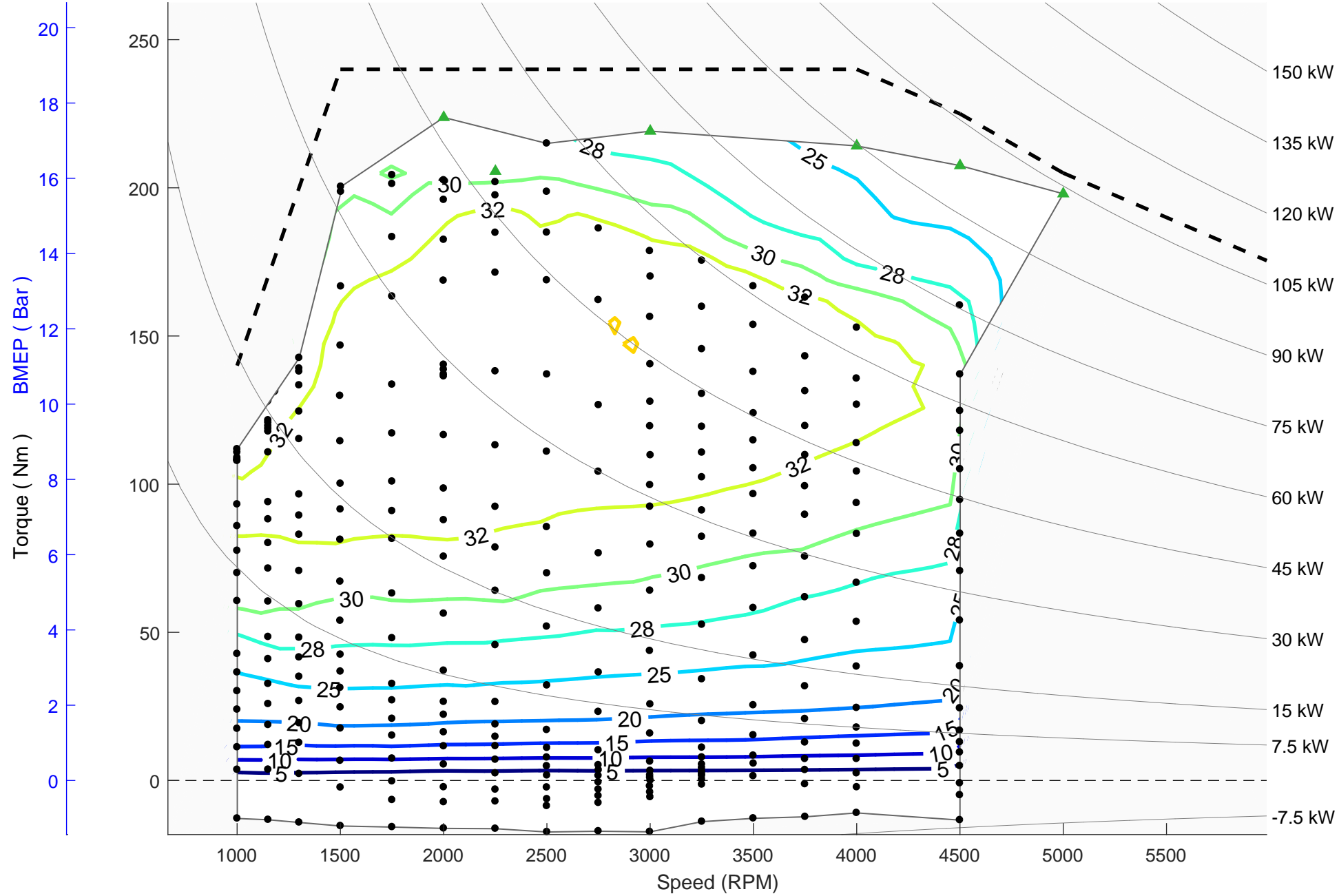
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
BSFC (g/kW-hr) - Brake Specific Fuel Consumption



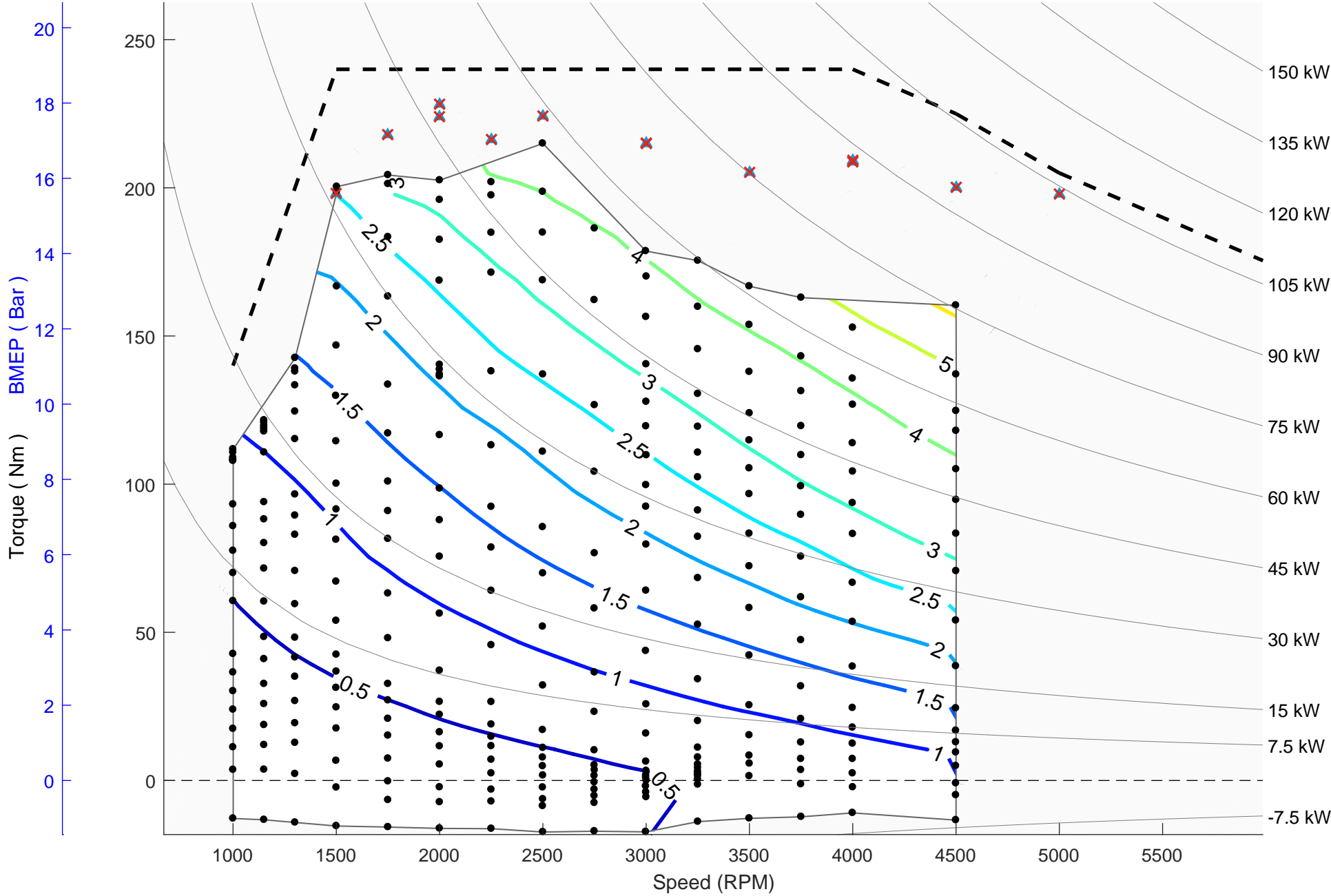
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
BTE (%) - Brake Thermal Efficiency



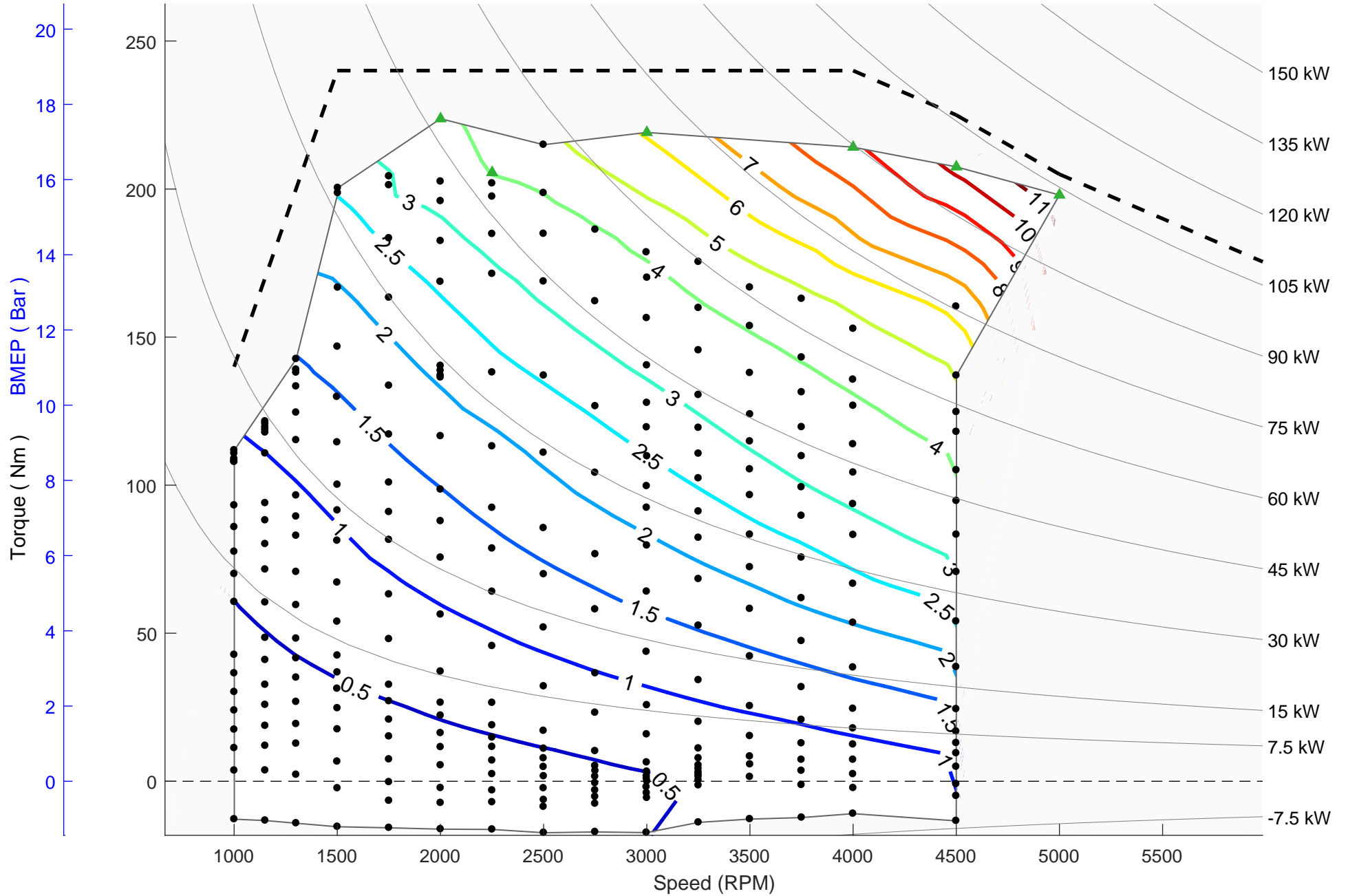
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
BTE (%) - Brake Thermal Efficiency



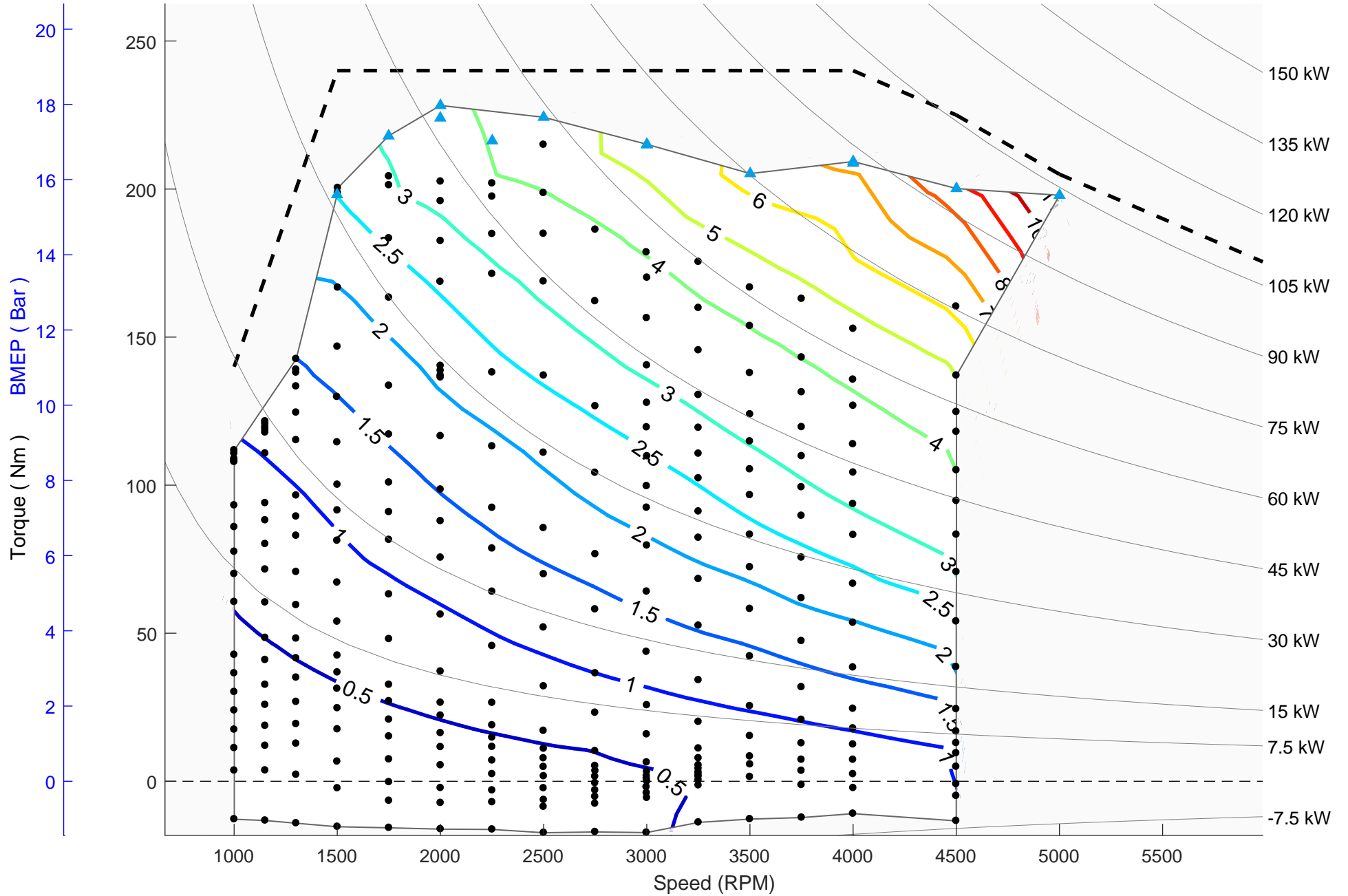
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Fuel Meter Flow (g/s) - Fuel Flow Measured with Flow Meter



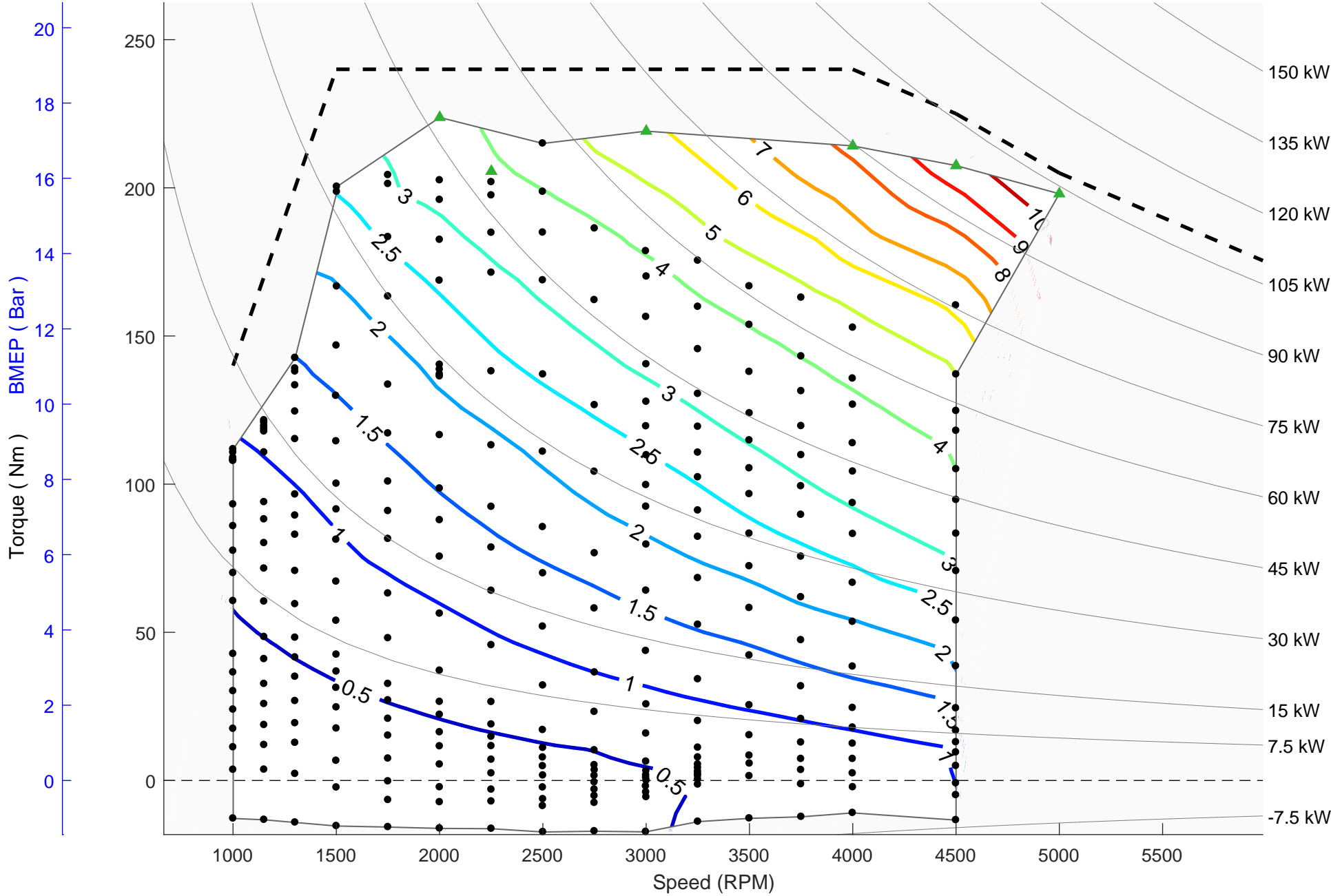
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Fuel Meter Flow (g/s) - Fuel Flow Measured with Flow Meter



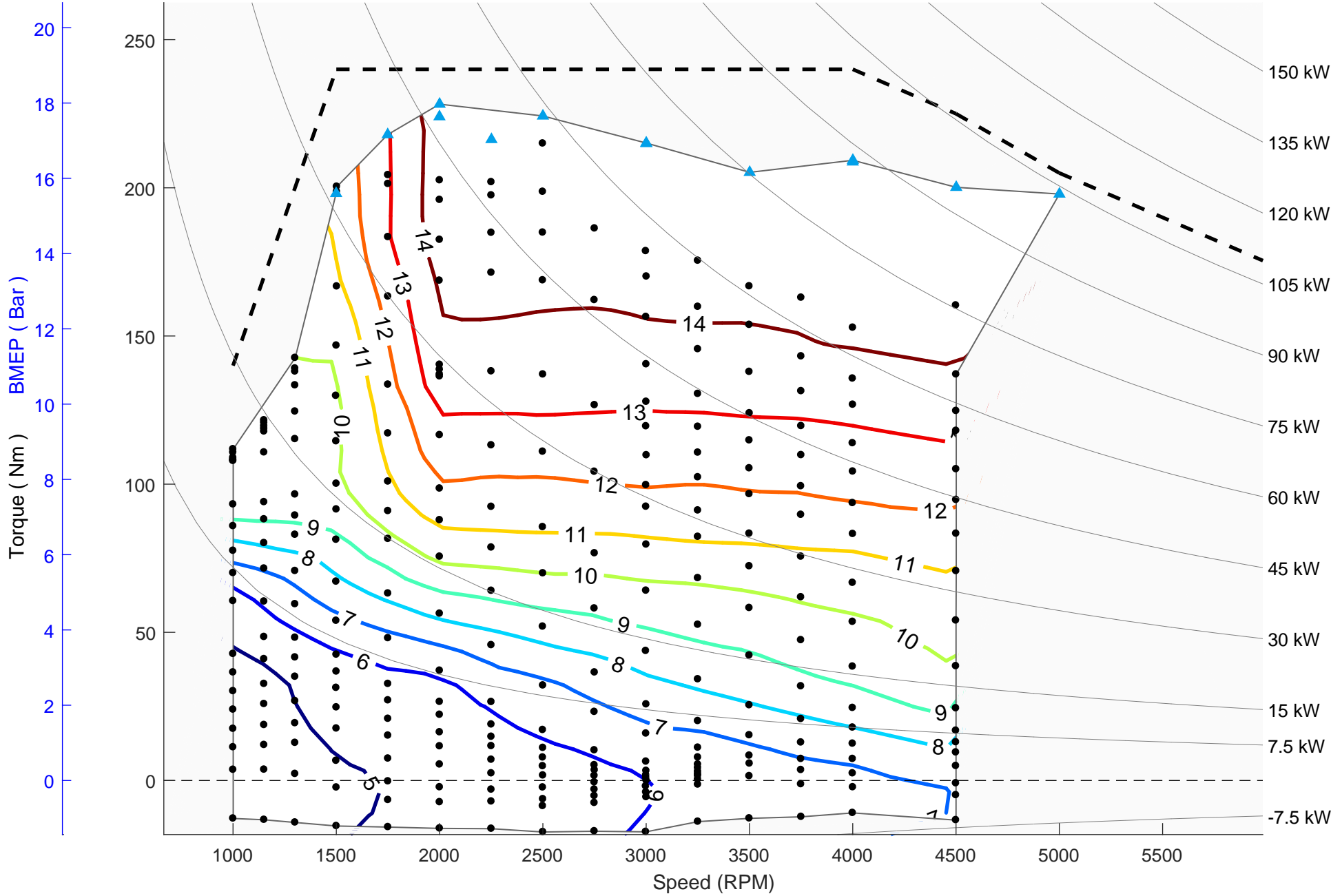
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Injector Fuel Flow (g/s) - Fuel Flow Estimate from Injector Calibration



2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Injector Fuel Flow (g/s) - Fuel Flow Estimate from Injector Calibration

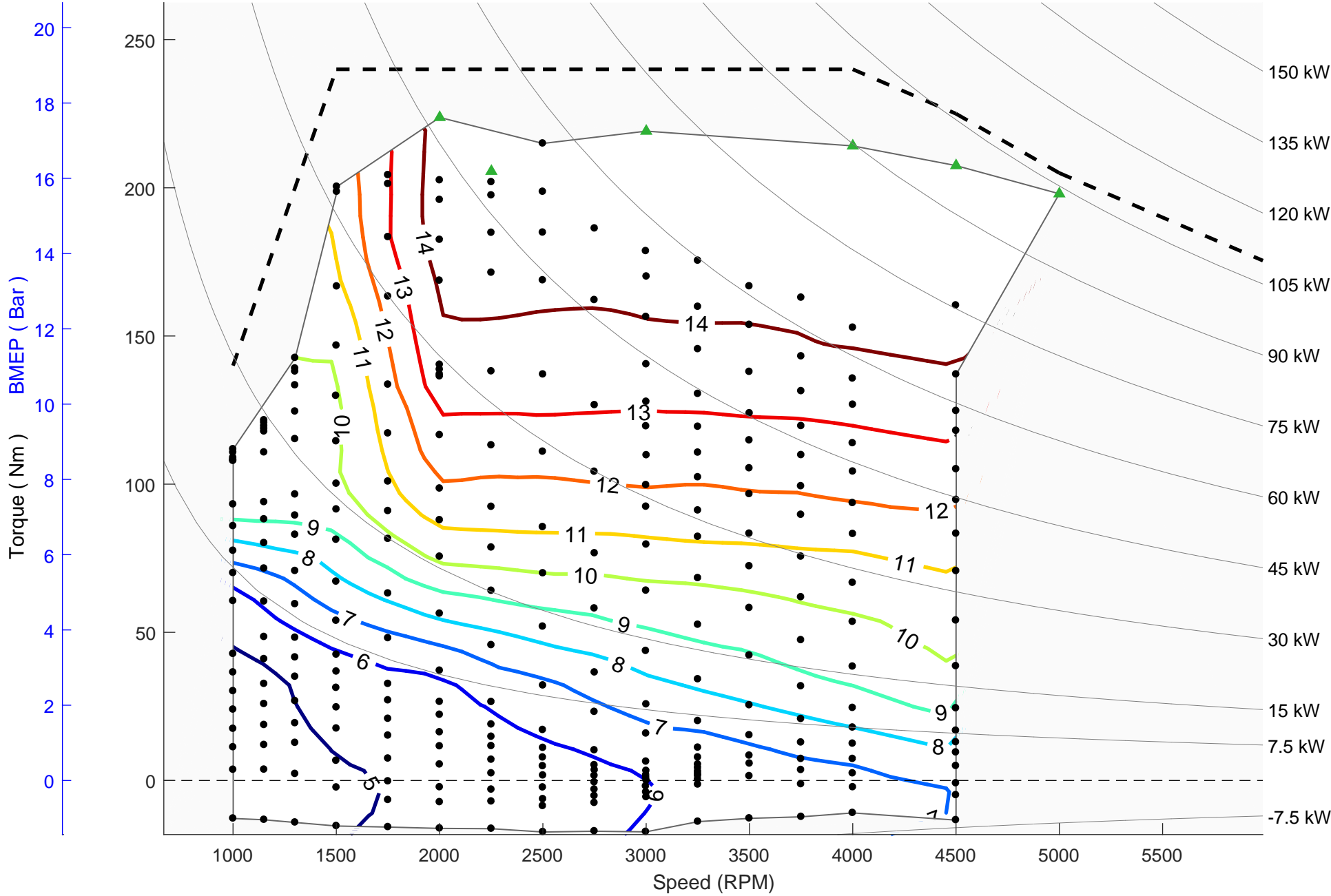


2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Fuel Rail Press (MPaG) - Fuel Rail Pressure*



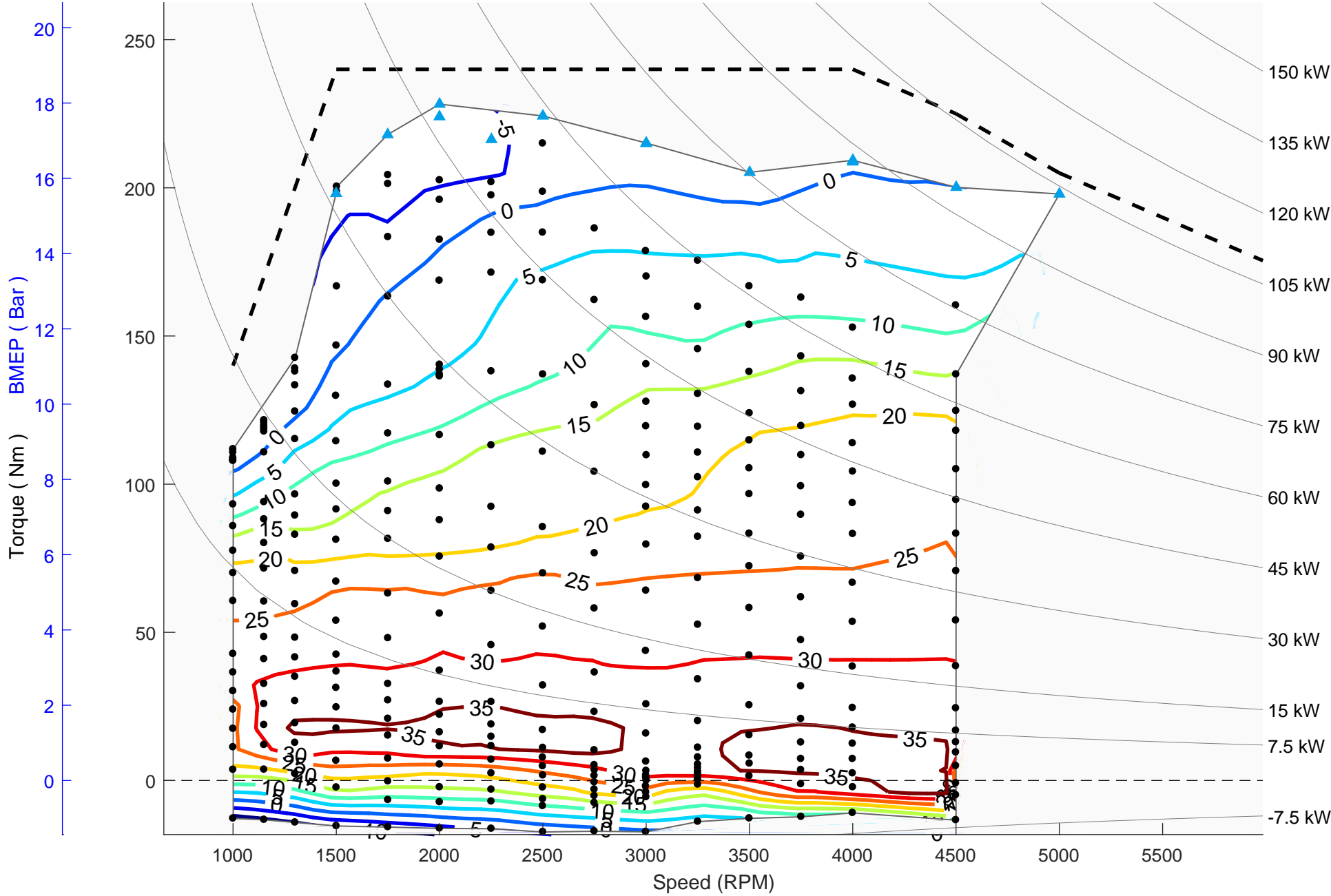
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2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Fuel Rail Press (MPaG) - Fuel Rail Pressure*



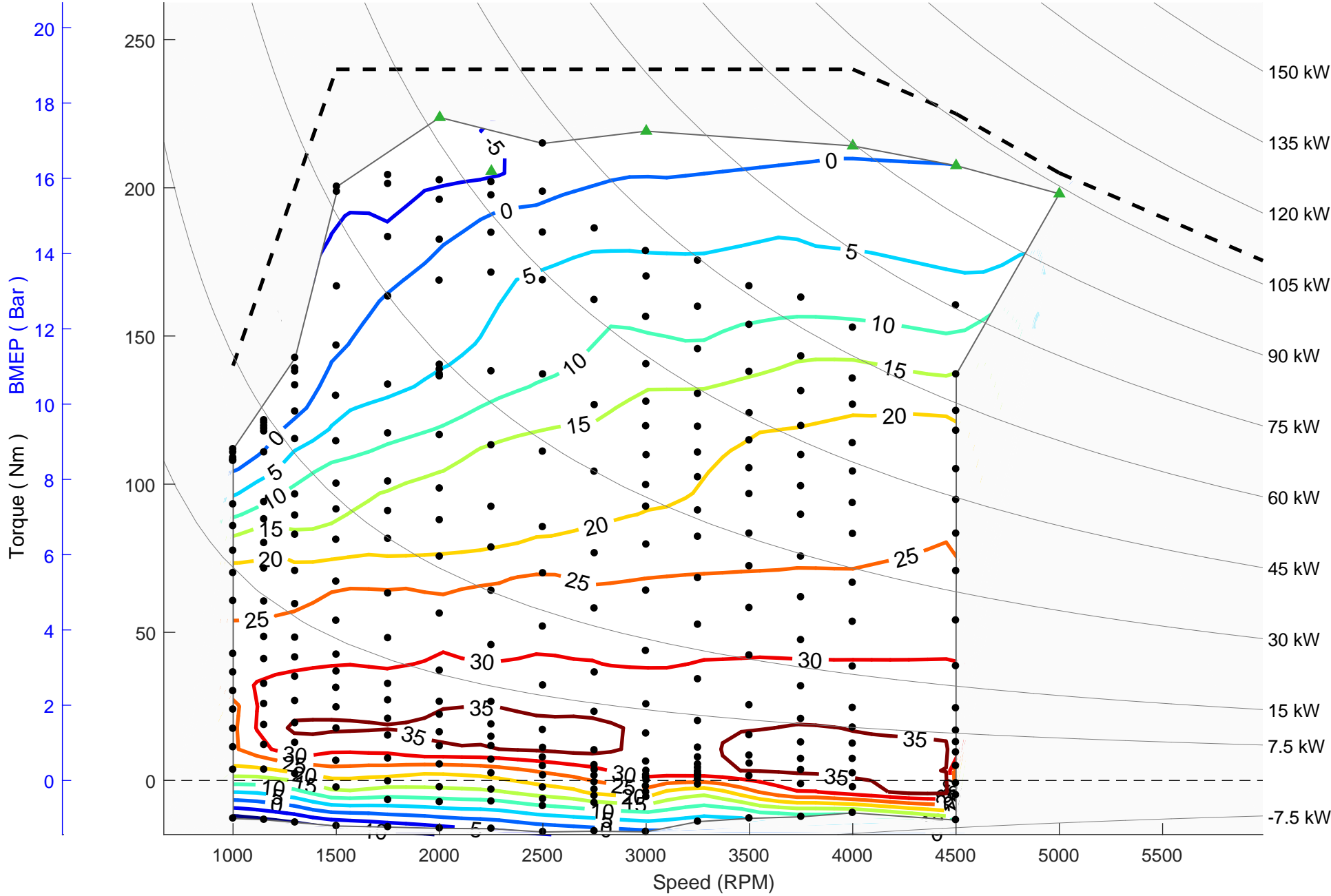
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2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Spark Timing (CAD BTDC) - Average Spark Timing Across all Cylinders*



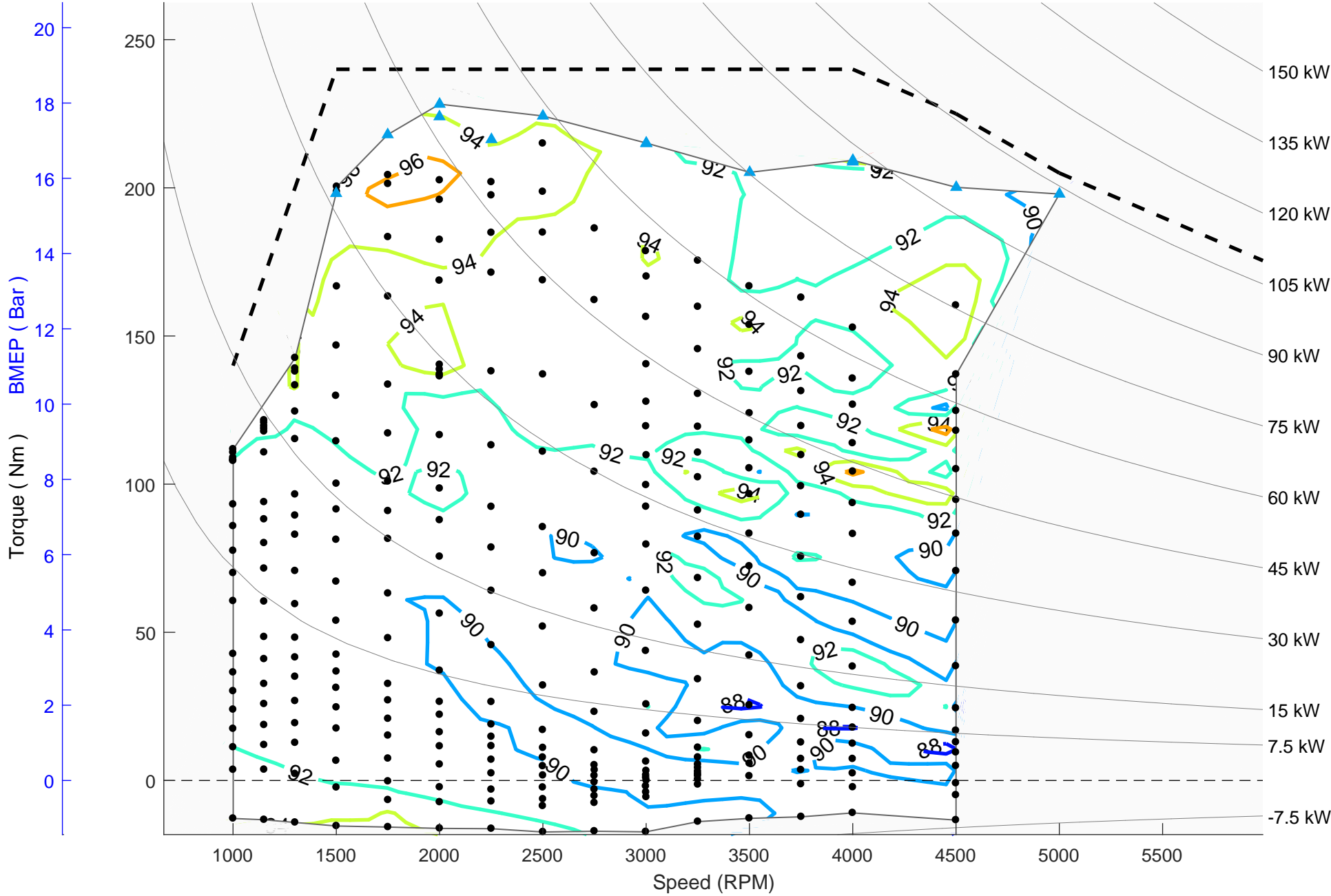
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2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Spark Timing (CAD BTDC) - Average Spark Timing Across all Cylinders*

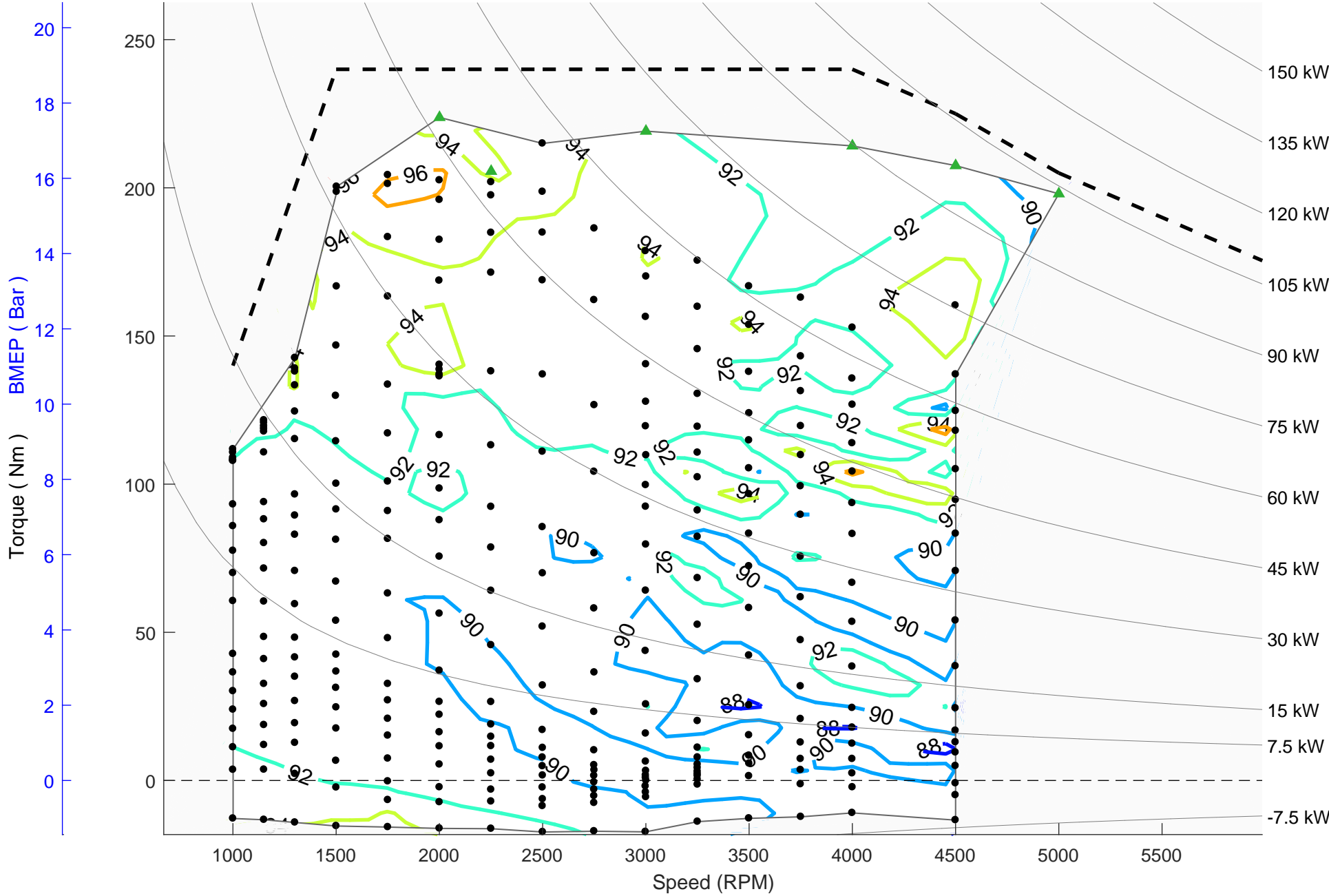


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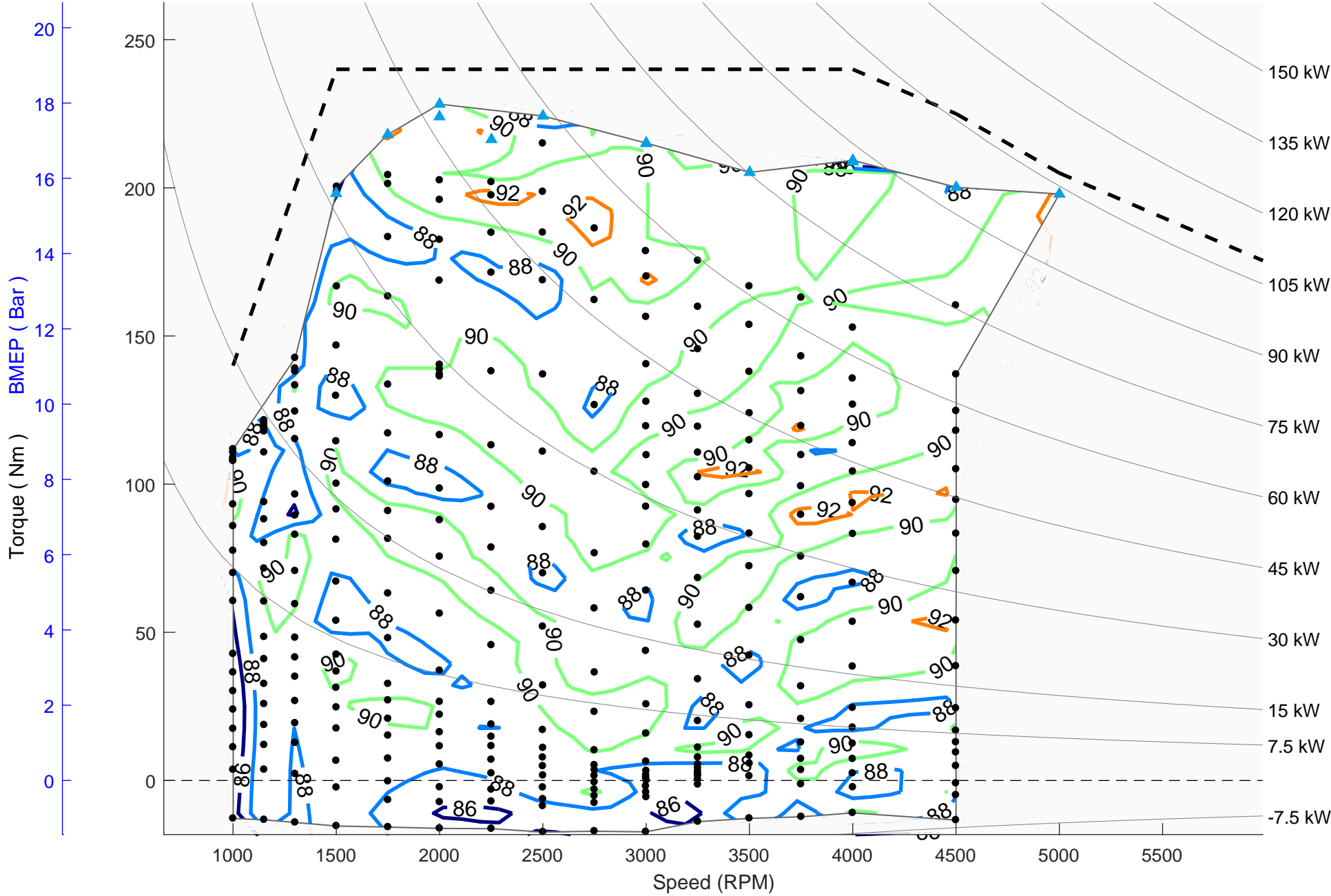
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Coolant Temp (degC) - Coolant Temperature



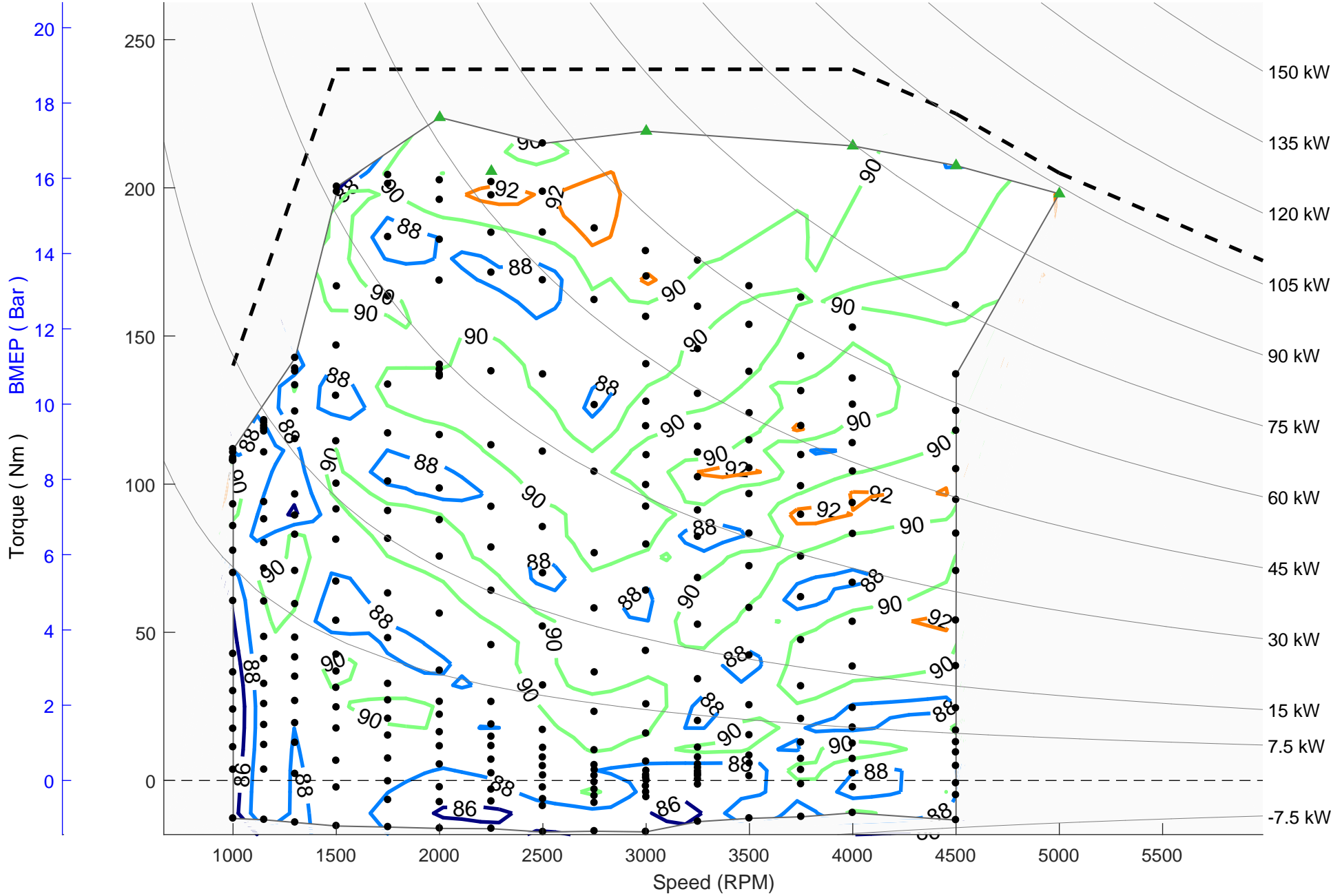
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Coolant Temp (degC) - Coolant Temperature

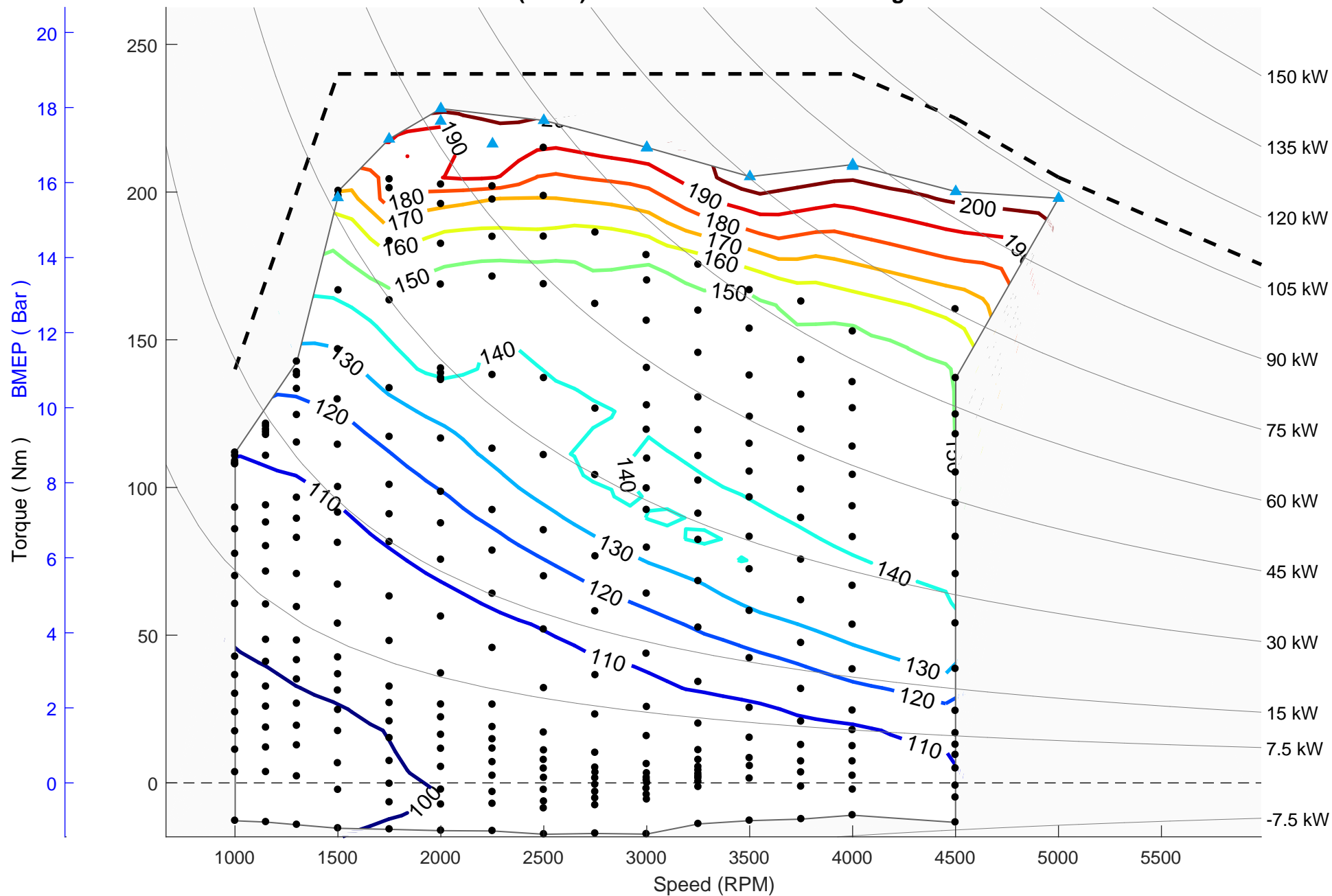


2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Oil Sump Temp (degC) - Oil Temperature

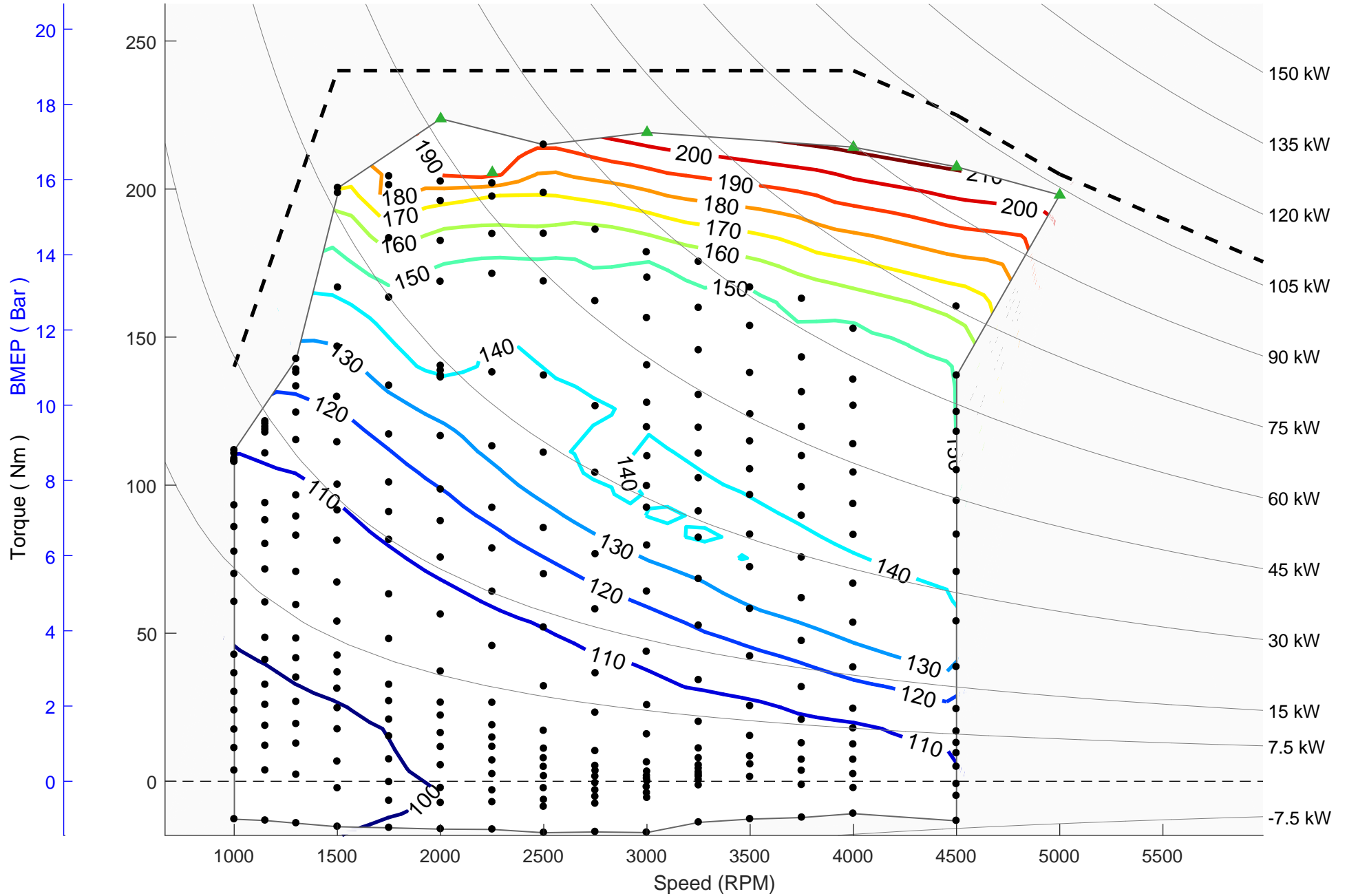


2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Oil Sump Temp (degC) - Oil Temperature

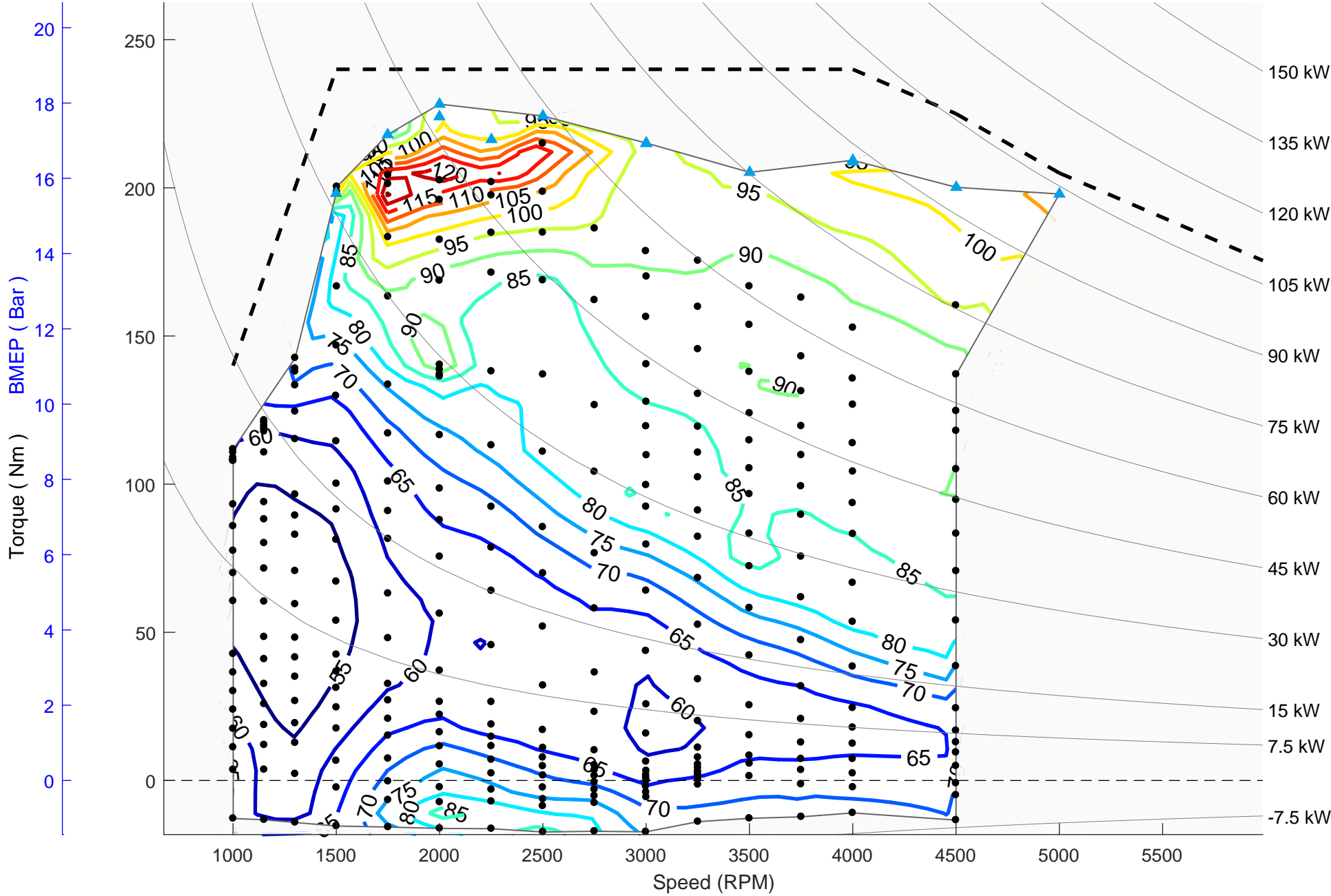




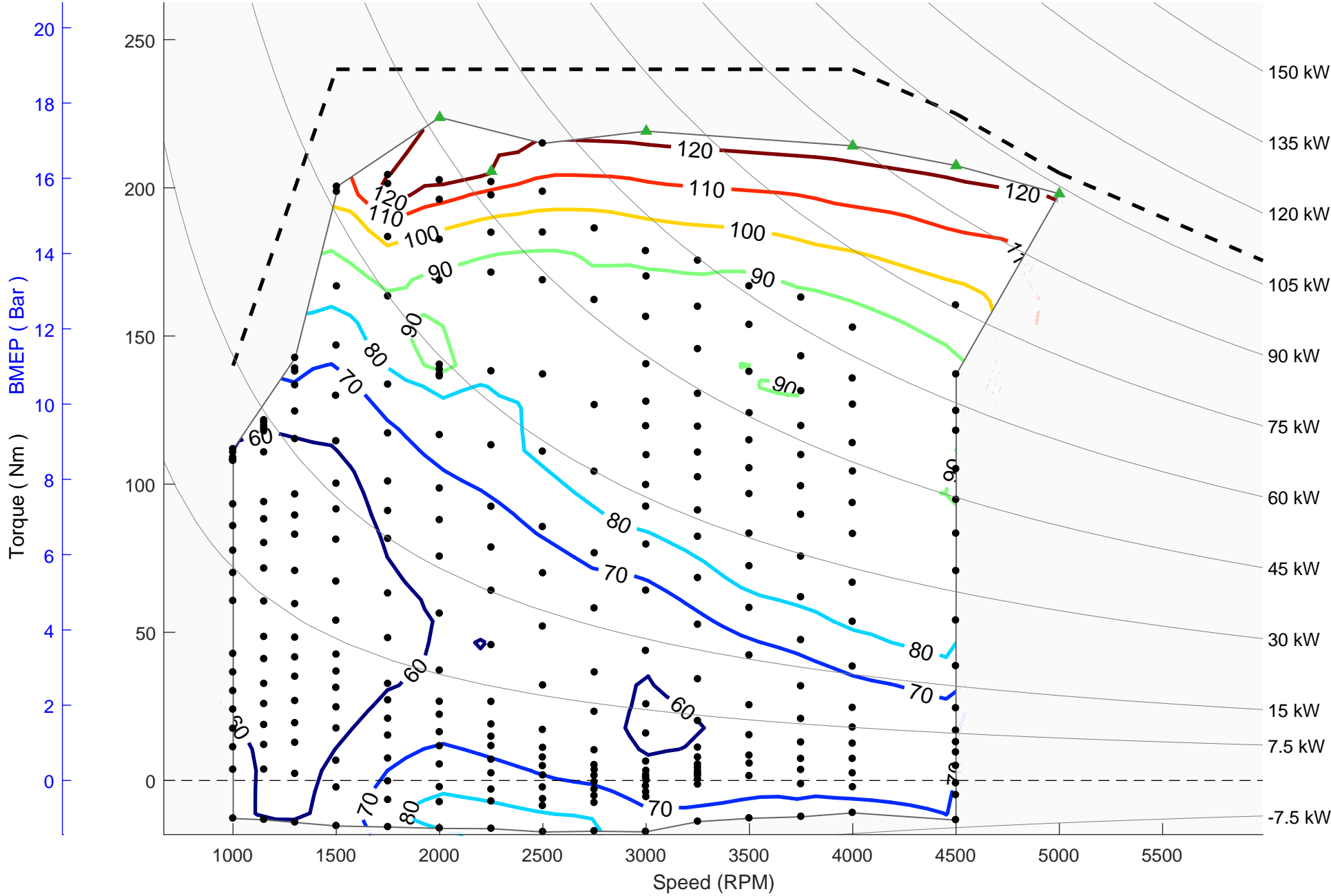
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
CAC Inlet Press (kPaA) - Pressure Measured at Charge Air Cooler Inlet

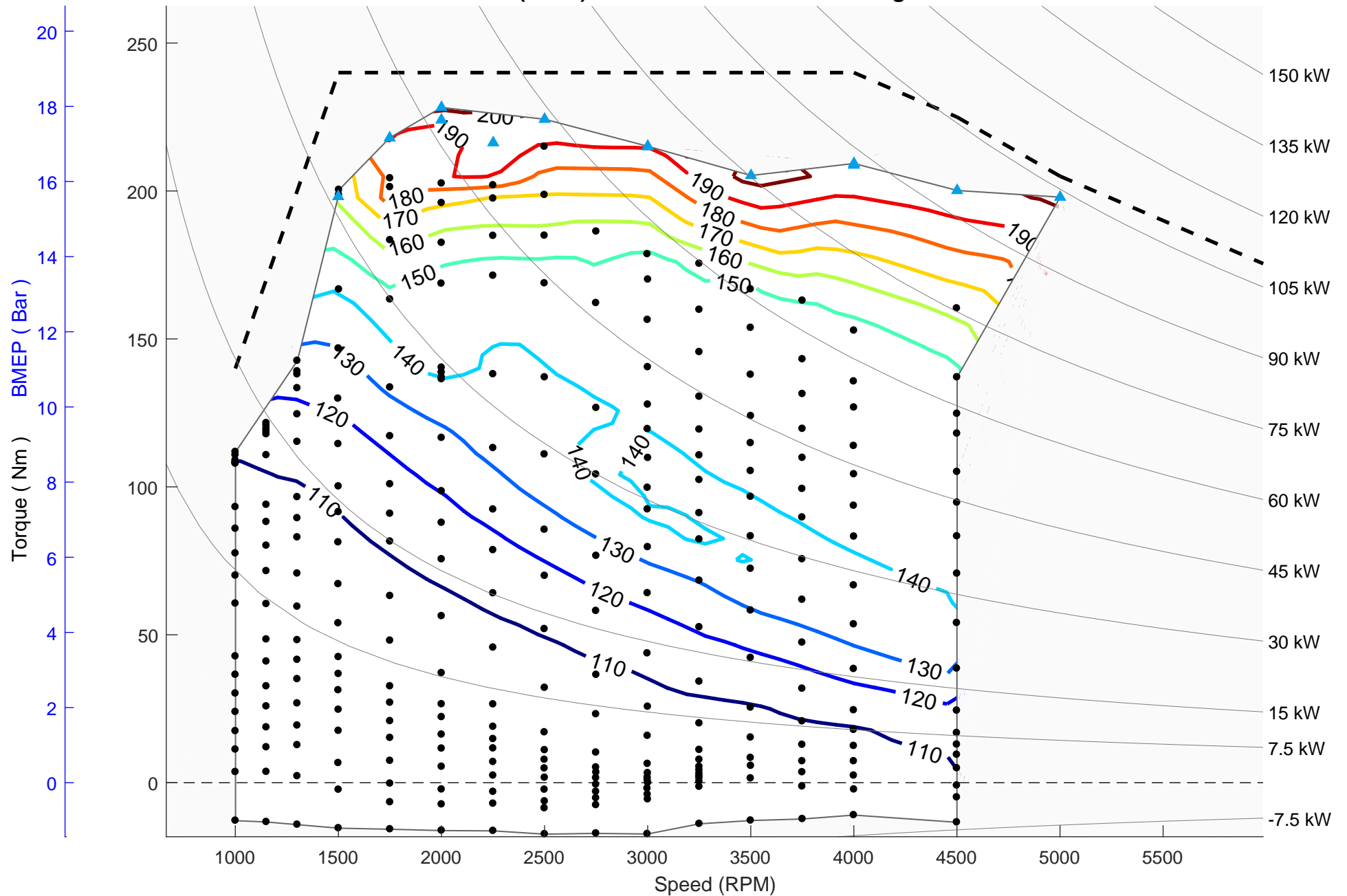


2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
CAC Inlet Temp (degC) - Temperature Measured at Charge Air Cooler Inlet

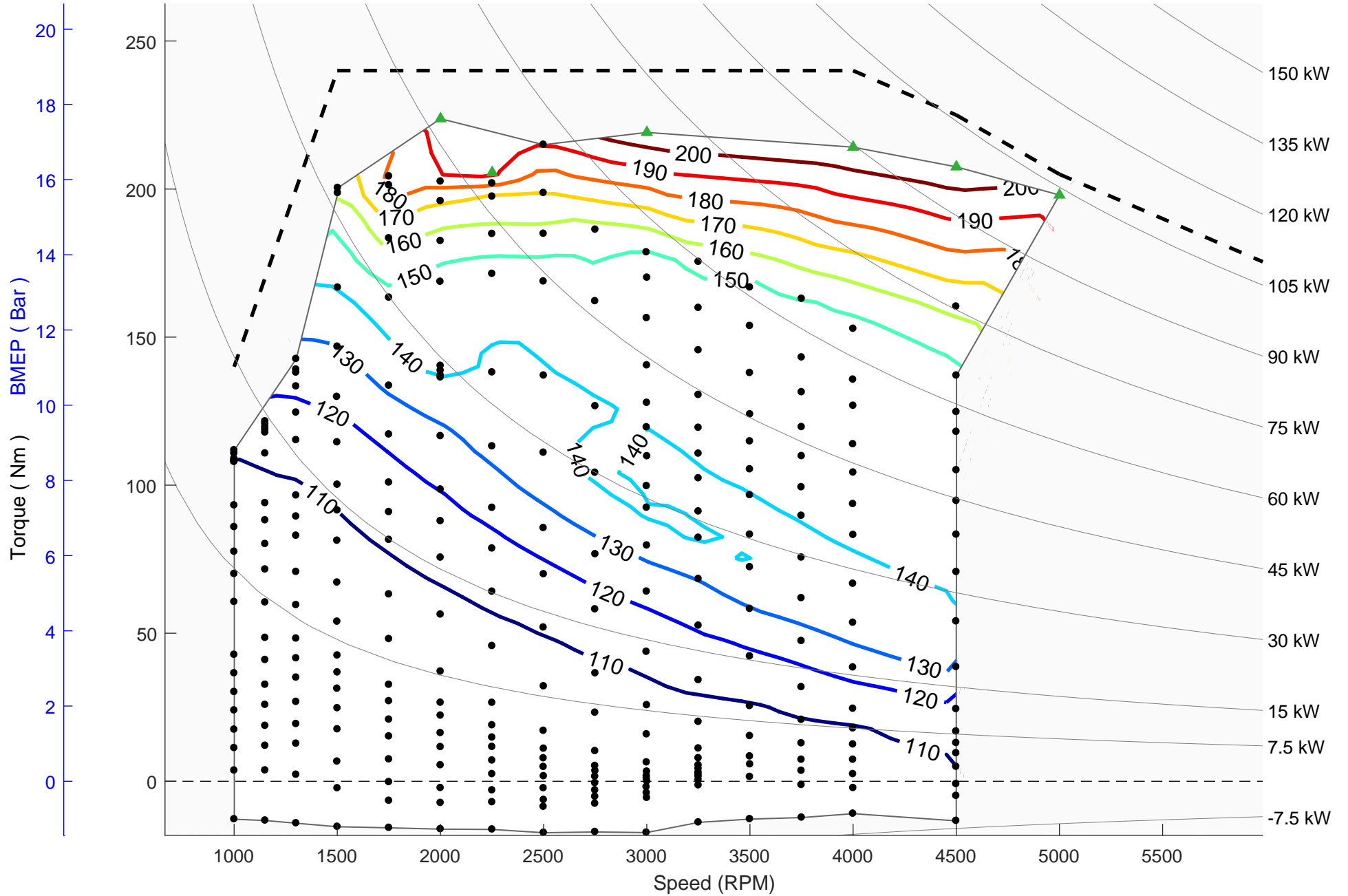


2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
CAC Inlet Temp (degC) - Temperature Measured at Charge Air Cooler Inlet

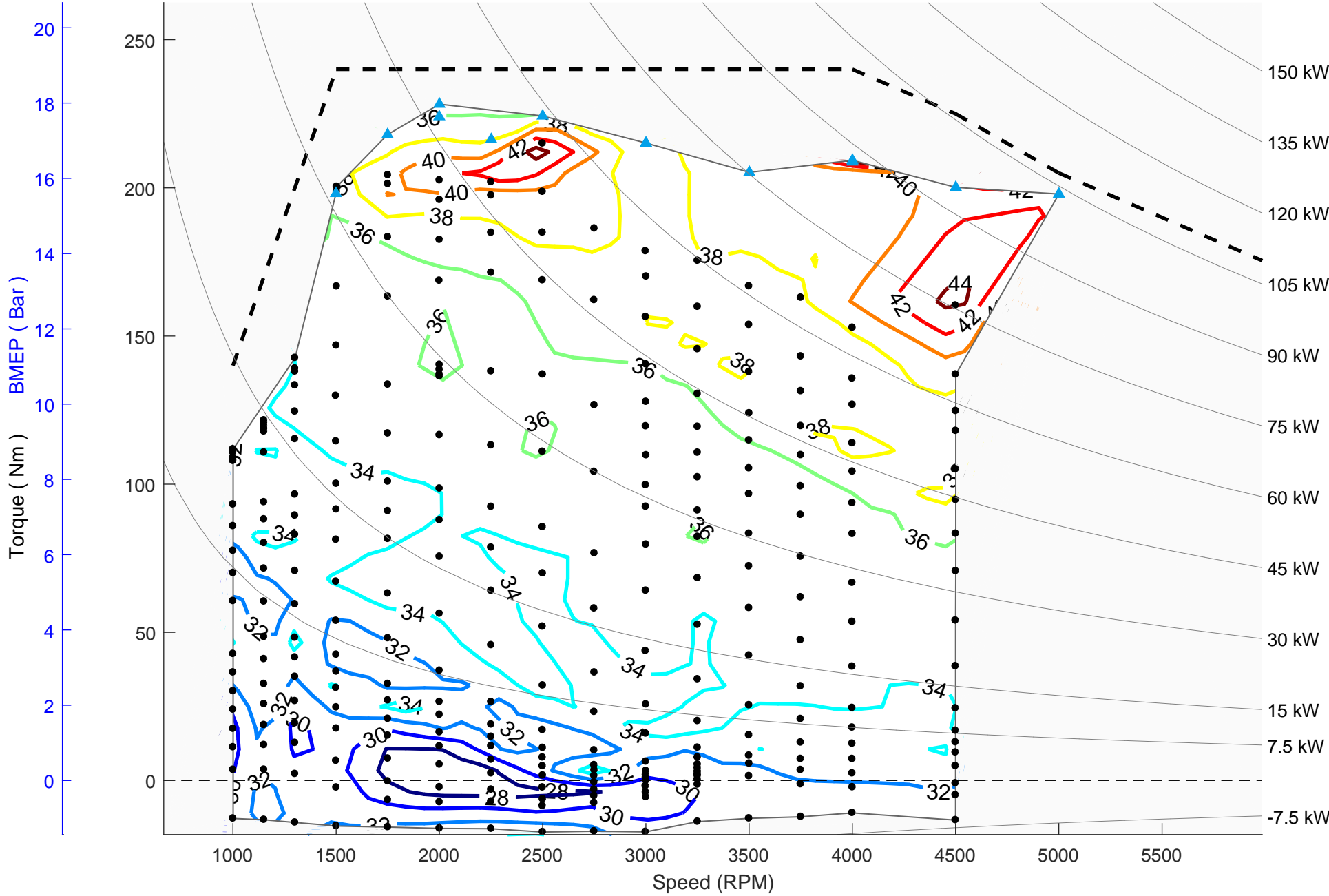




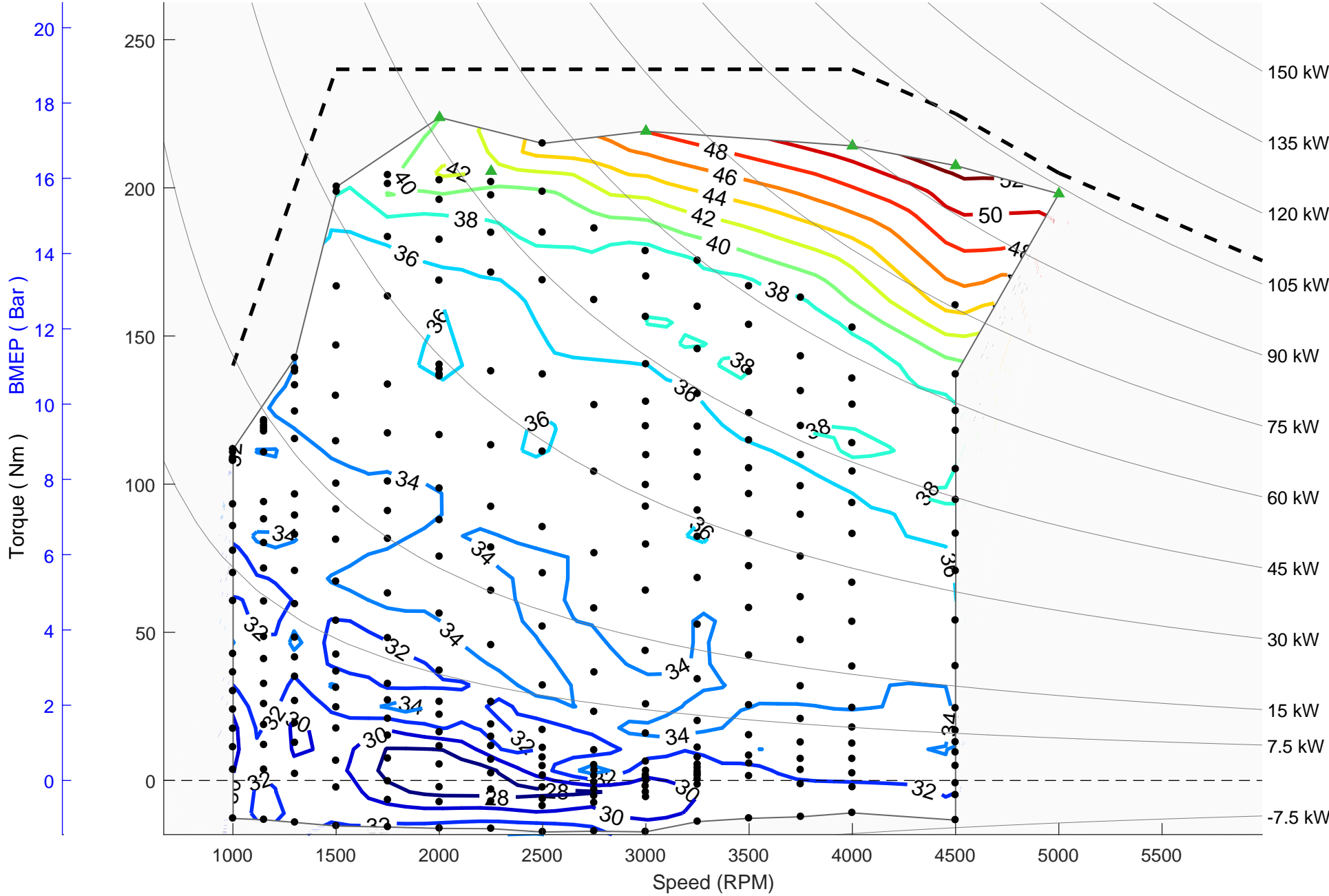
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
CAC Outlet Press (kPaA) - Pressure Measured at Charge Air Cooler Outlet



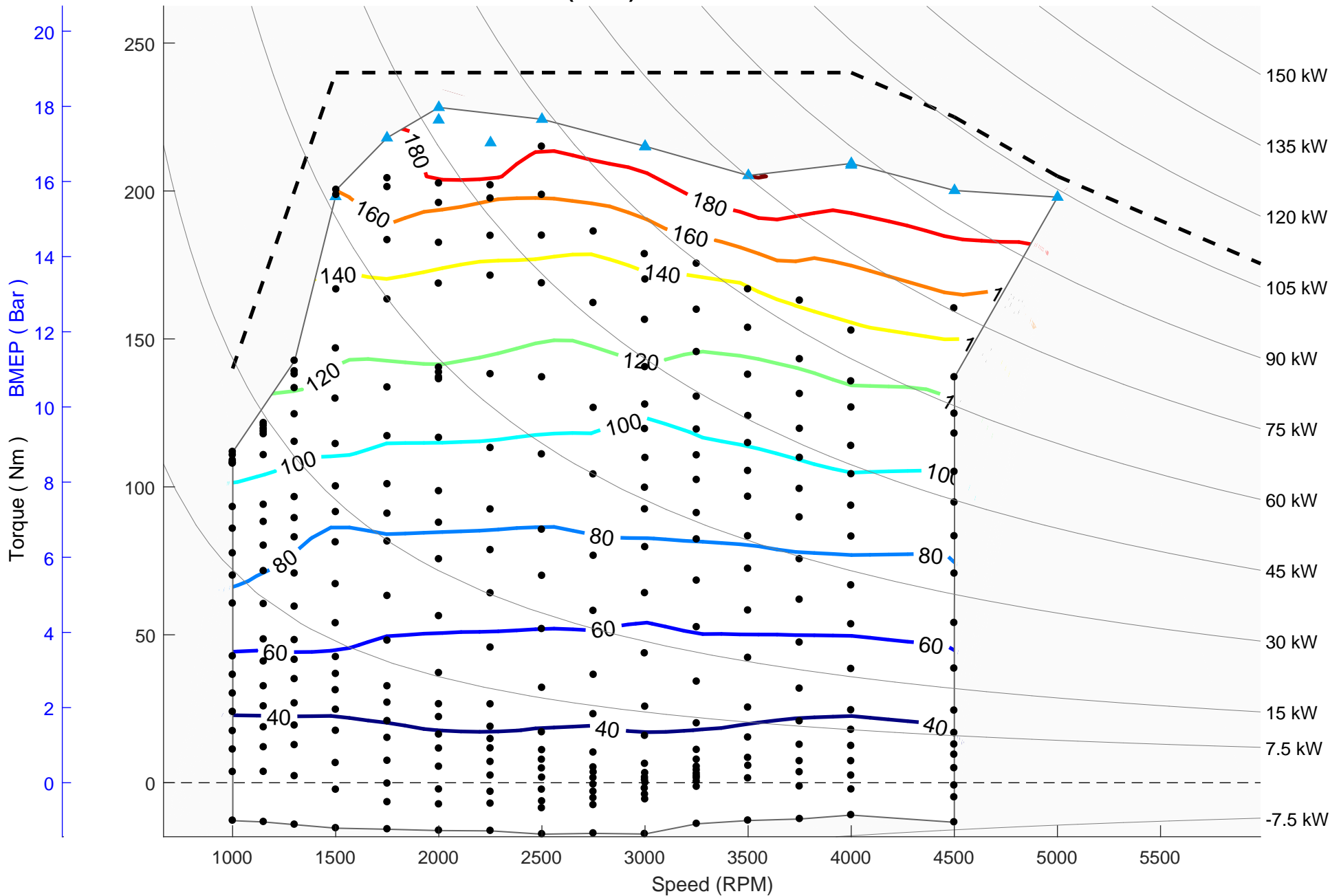
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
CAC Outlet Temp (degC) - Temperature Measured at Charge Air Cooler Outlet



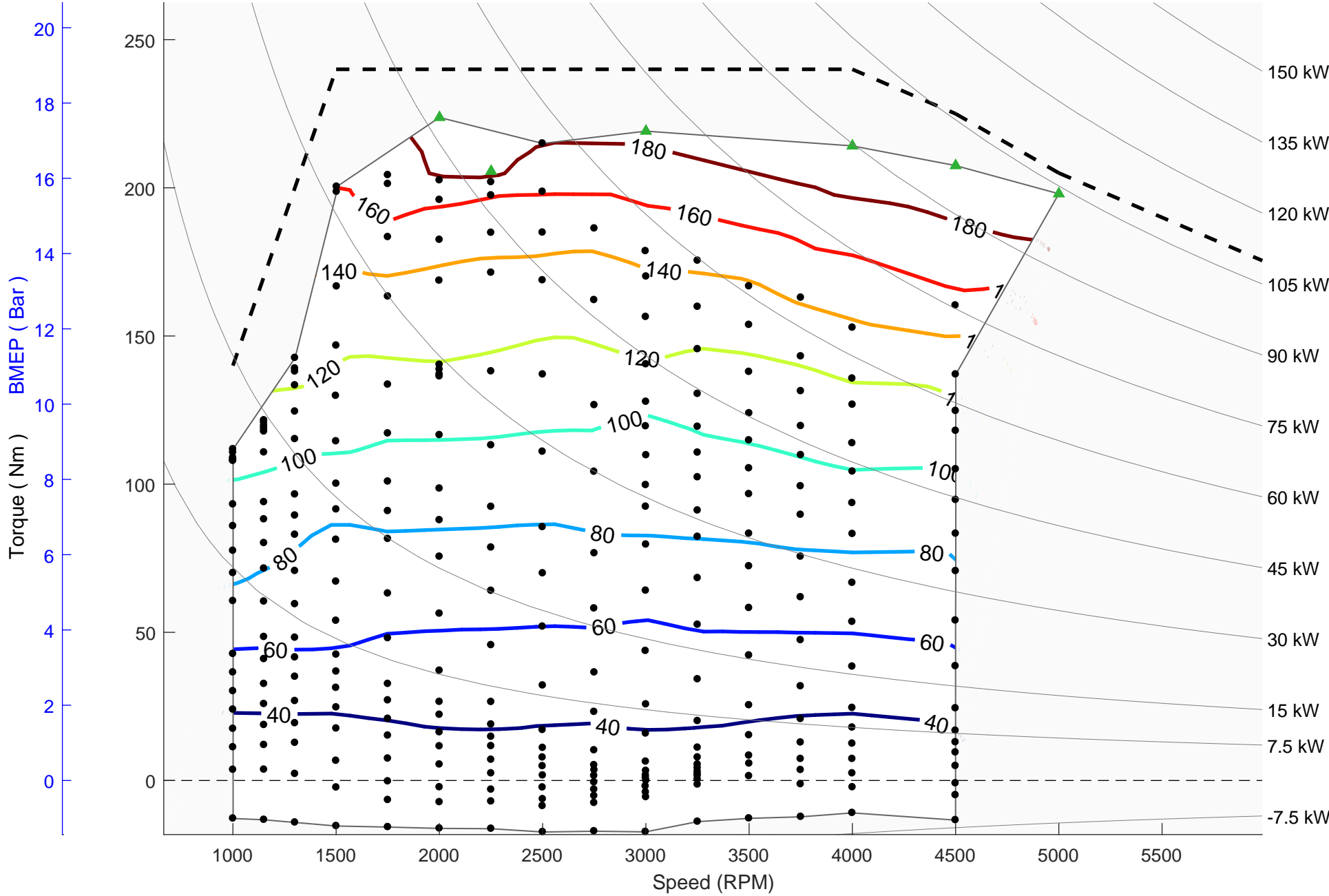
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
CAC Outlet Temp (degC) - Temperature Measured at Charge Air Cooler Outlet



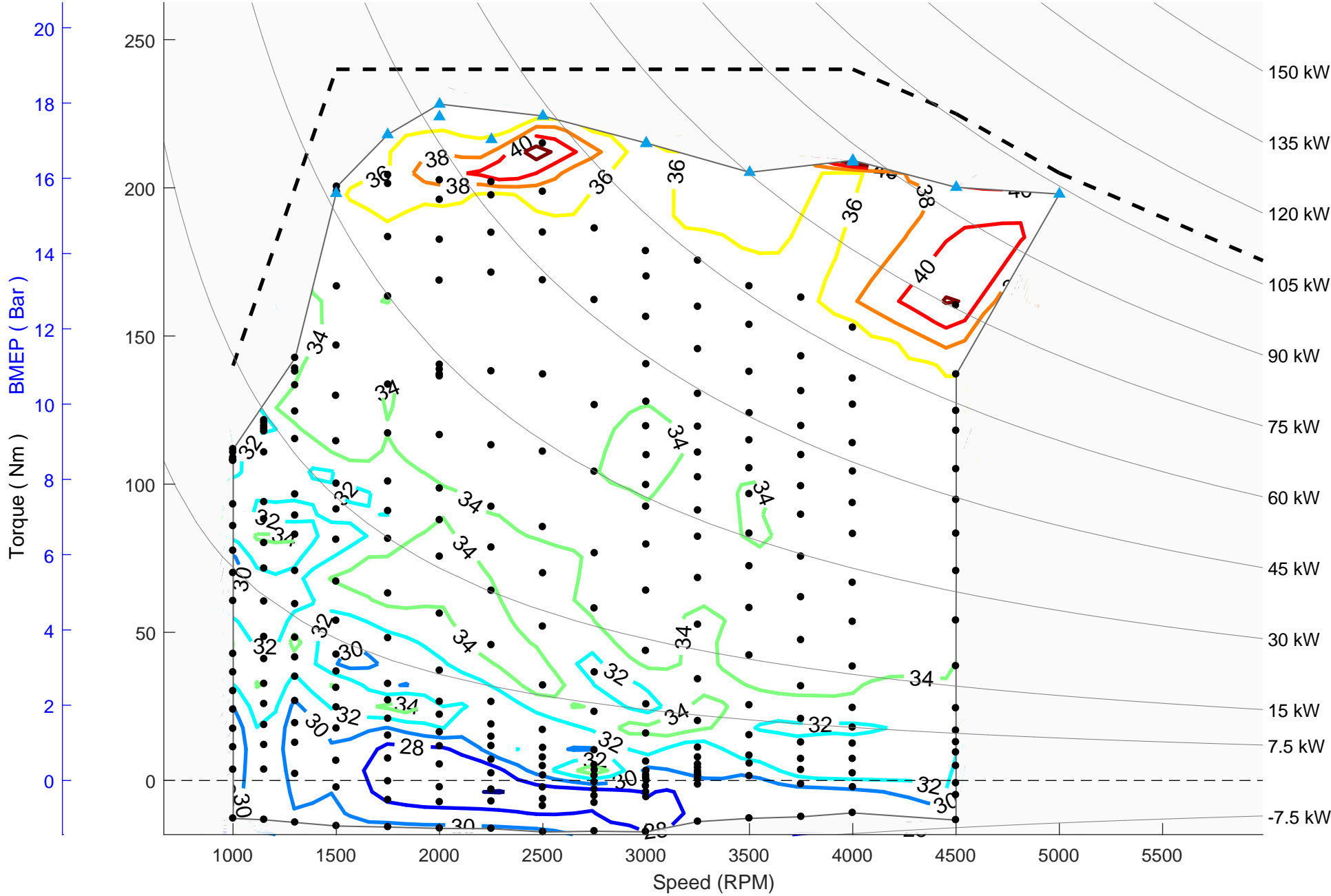
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Intake Manifold Press (kPaA) - Pressure Measured in the Intake Manifold



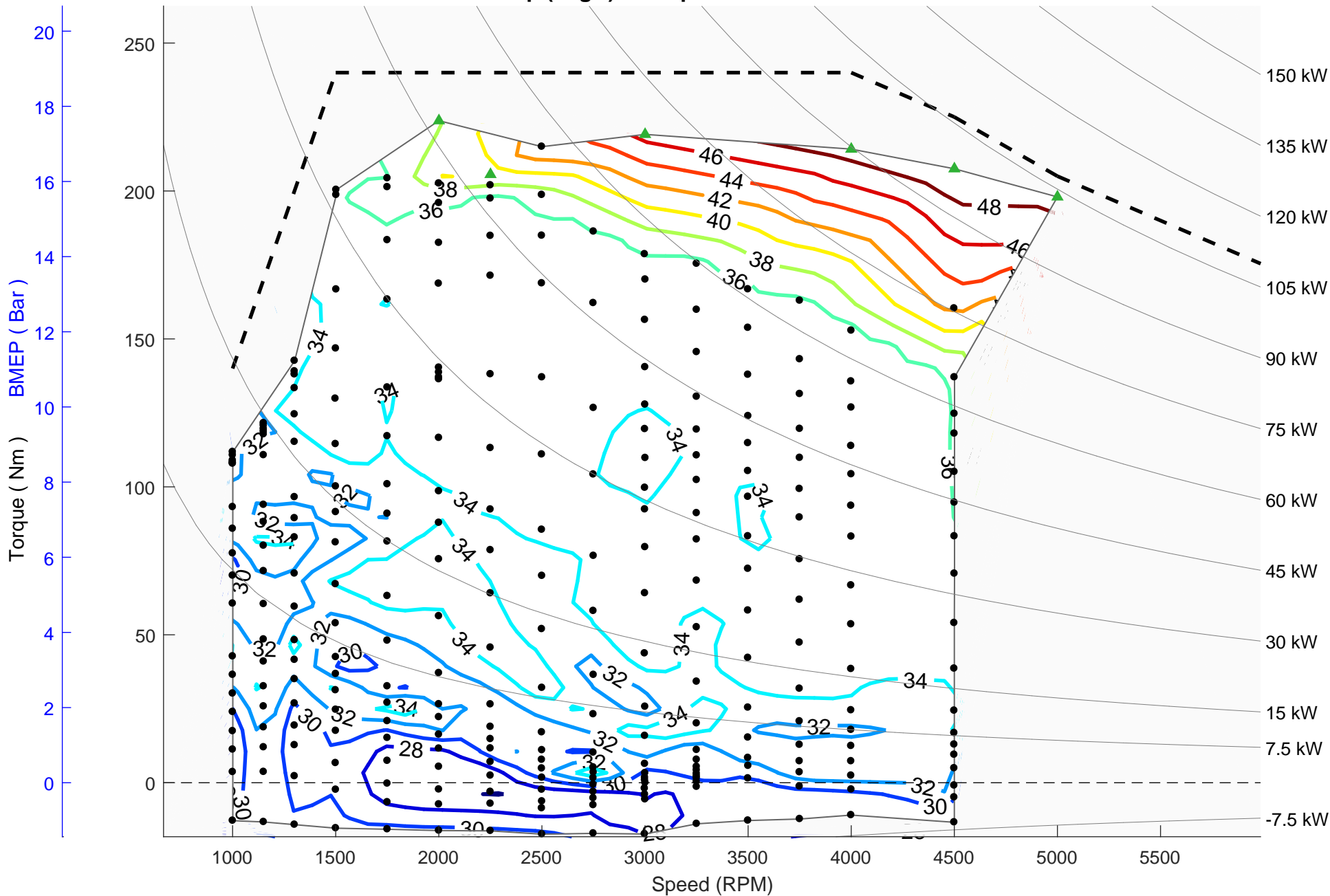
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Intake Manifold Press (kPaA) - Pressure Measured in the Intake Manifold



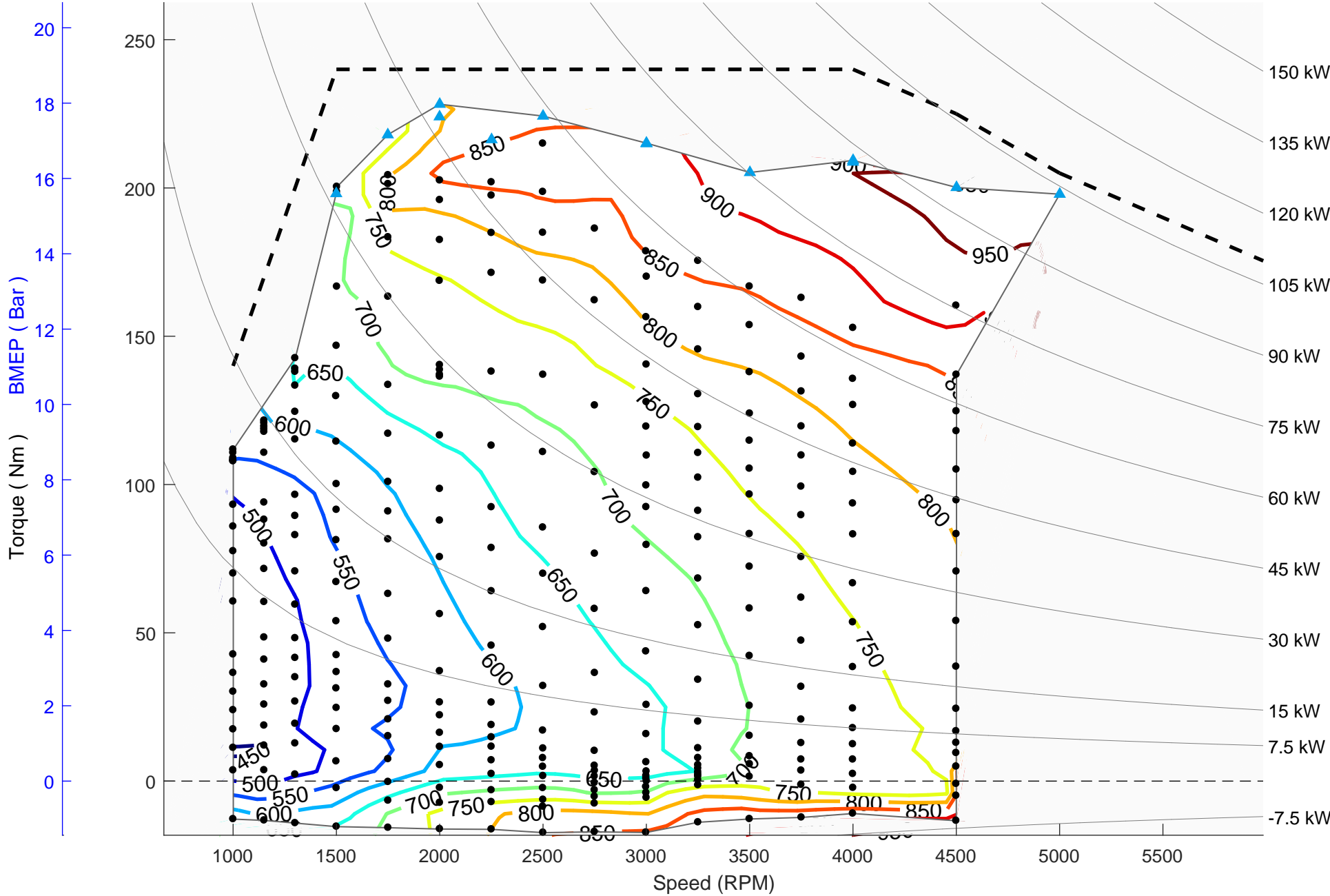
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Intake Manifold Temp (degC) - Temperature Measured in the Intake Manifold



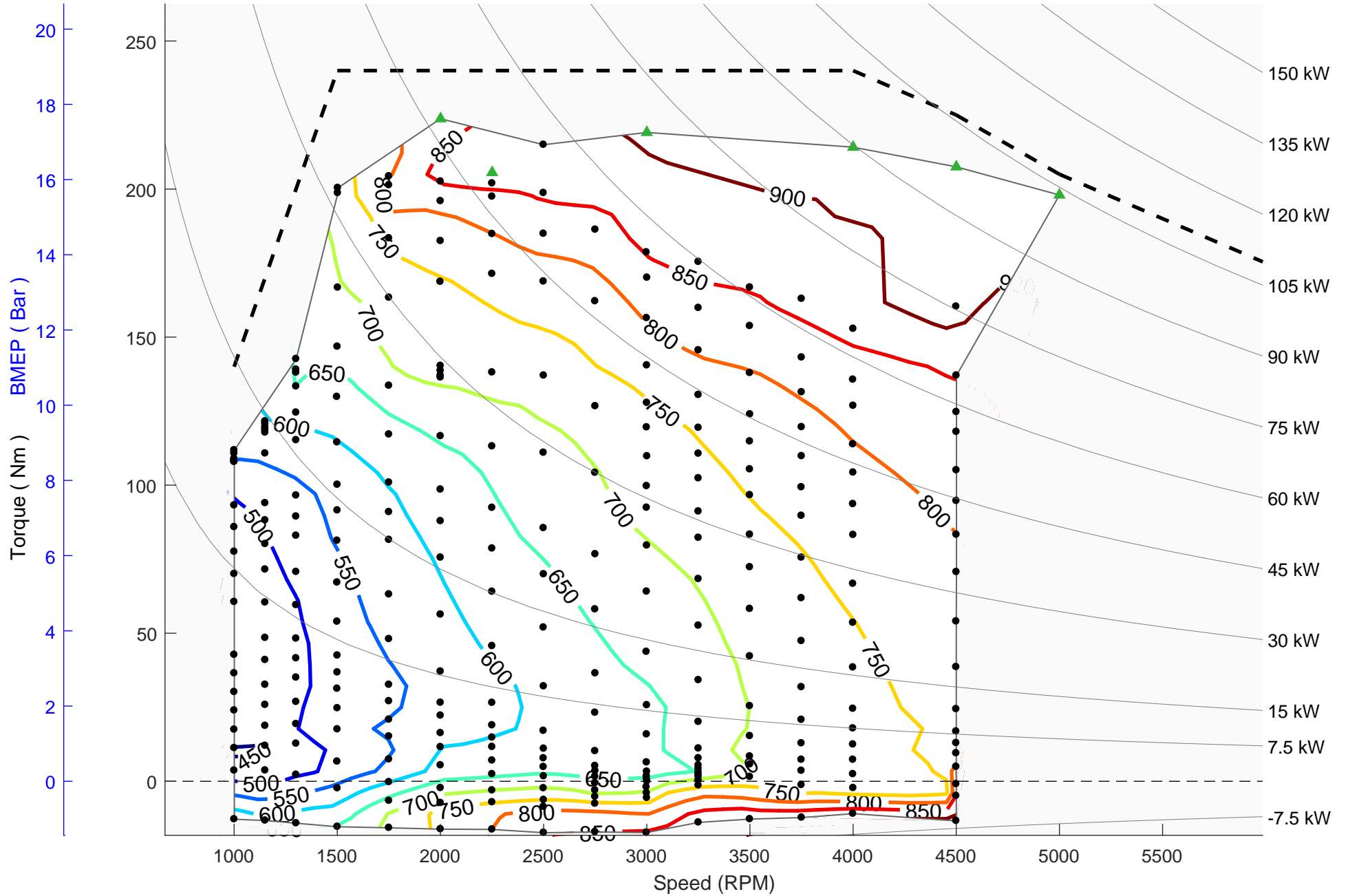
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Intake Manifold Temp (degC) - Temperature Measured in the Intake Manifold



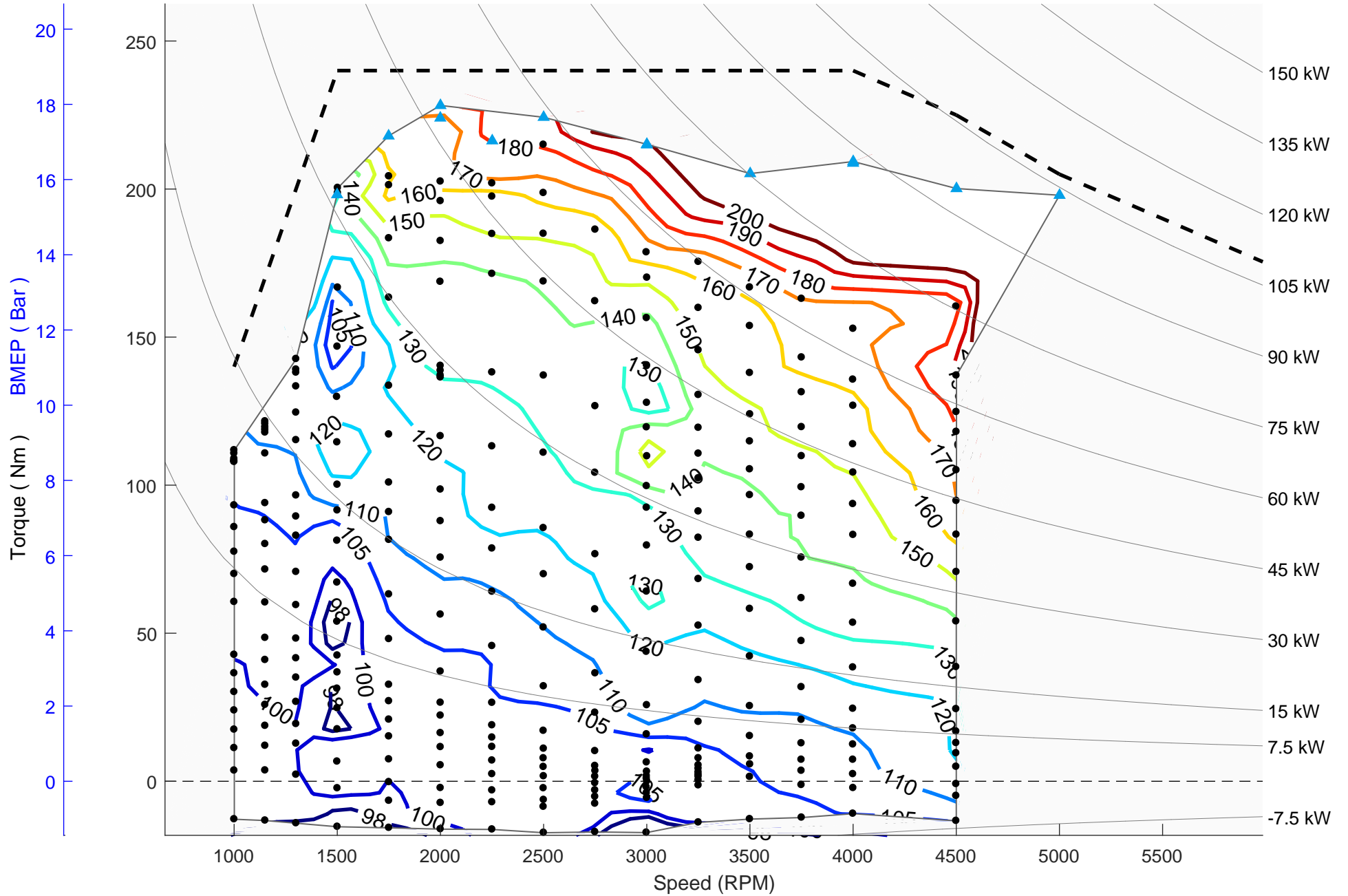
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Exhaust Port Temp (degC) - Average Exhaust Port Temperature Across all Cylinders



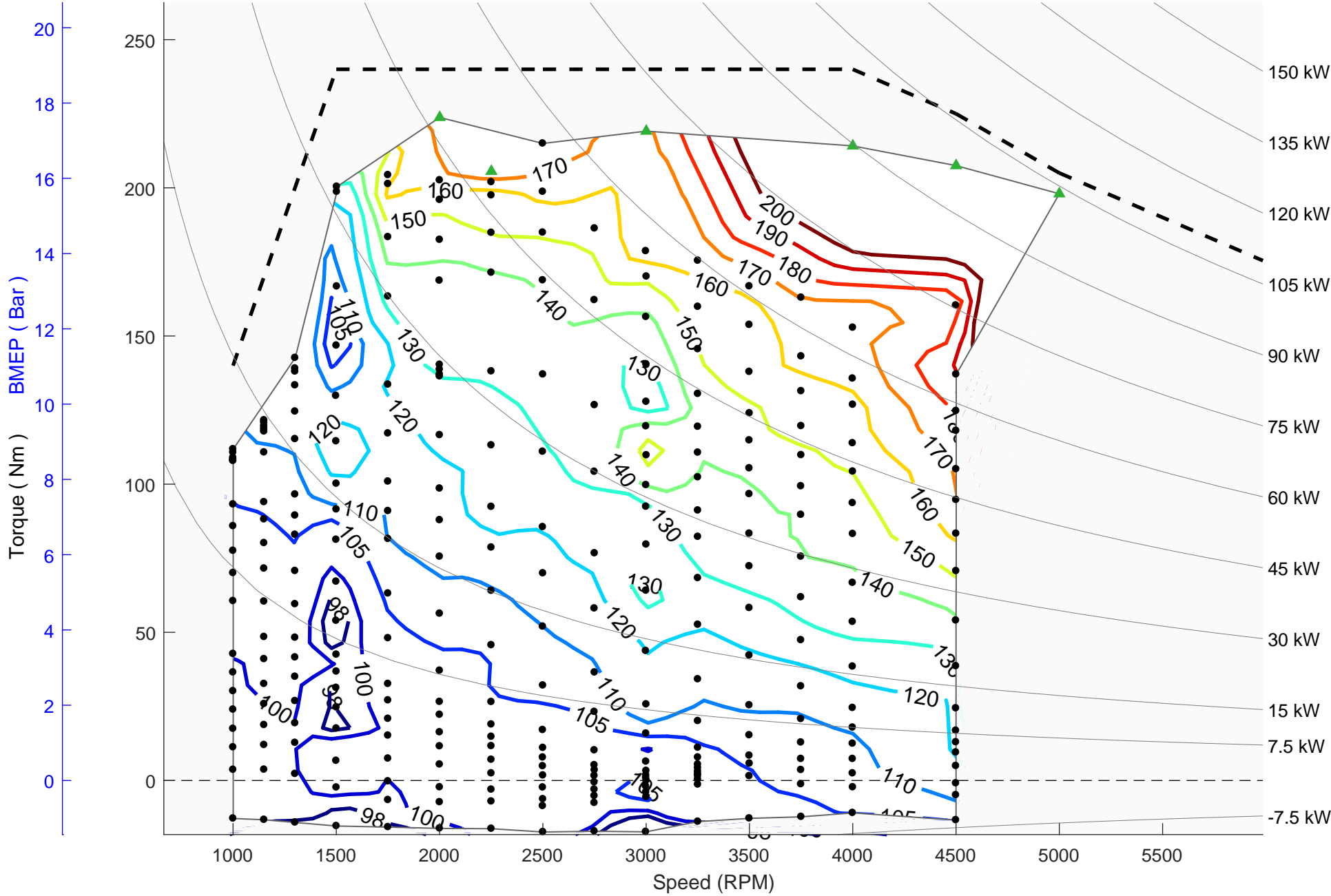
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Exhaust Port Temp (degC) - Average Exhaust Port Temperature Across all Cylinders



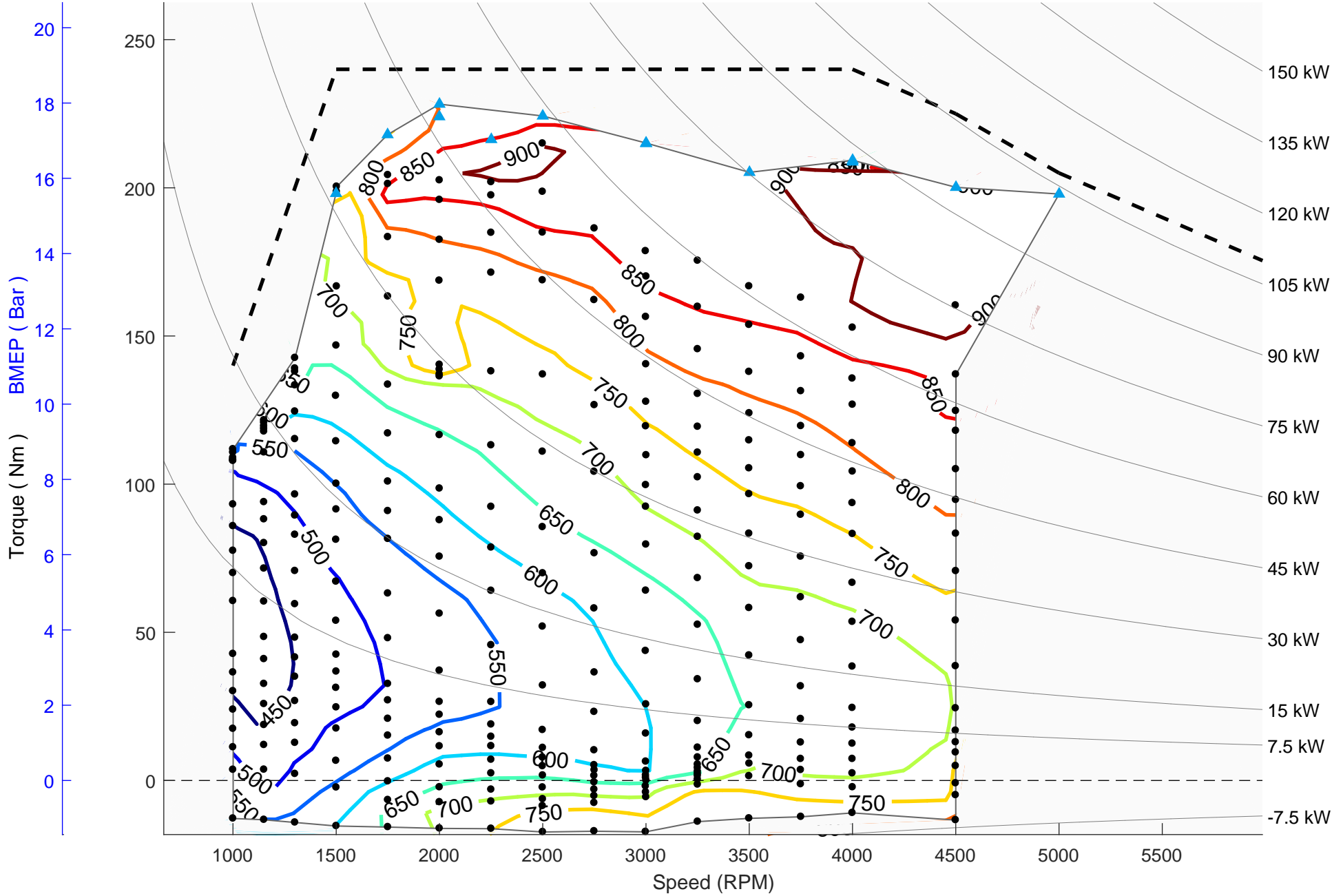
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Turbine Inlet Press (kPaA) - Pressure Measured at Turbocharger Turbine Inlet



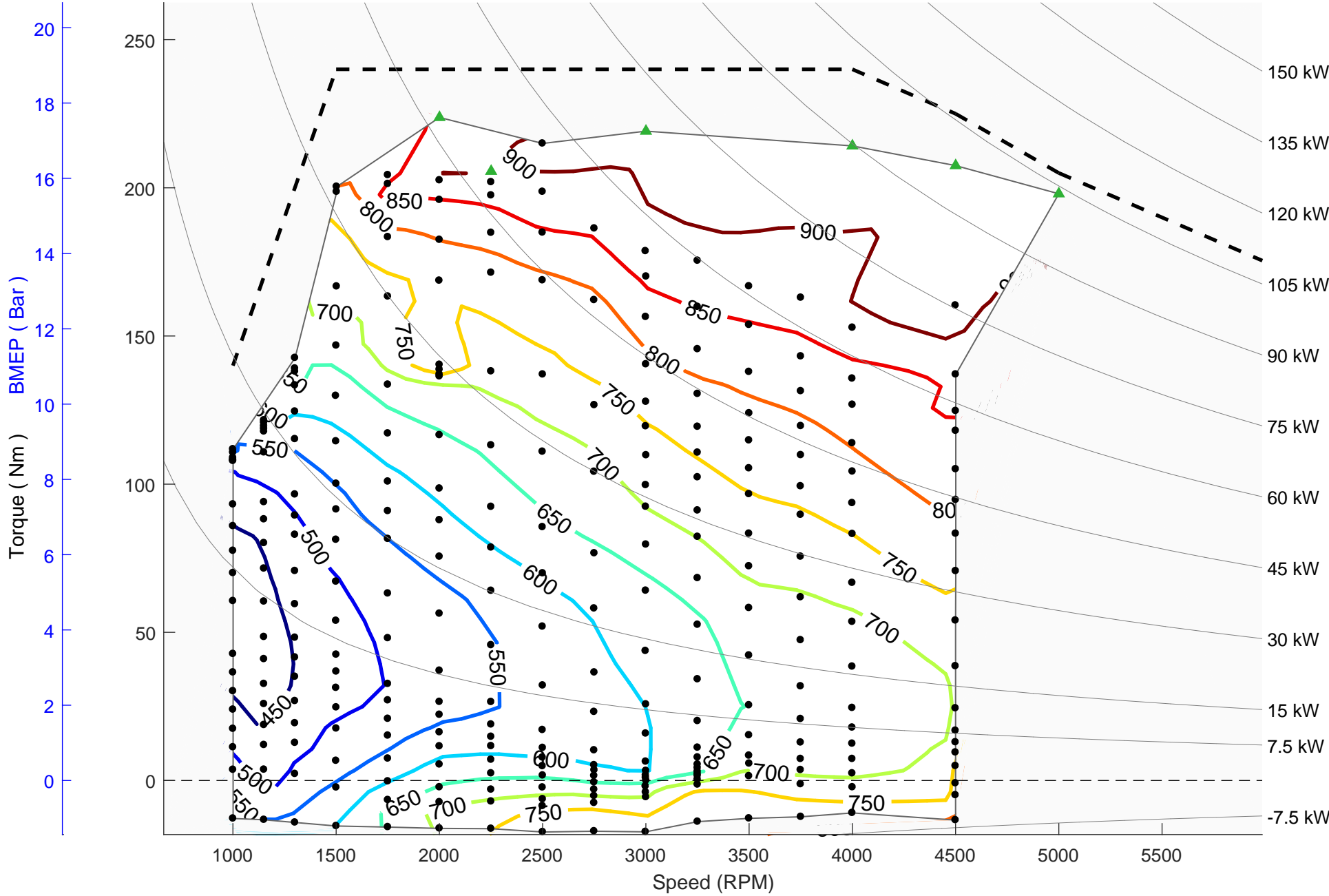
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Turbine Inlet Press (kPaA) - Pressure Measured at Turbocharger Turbine Inlet

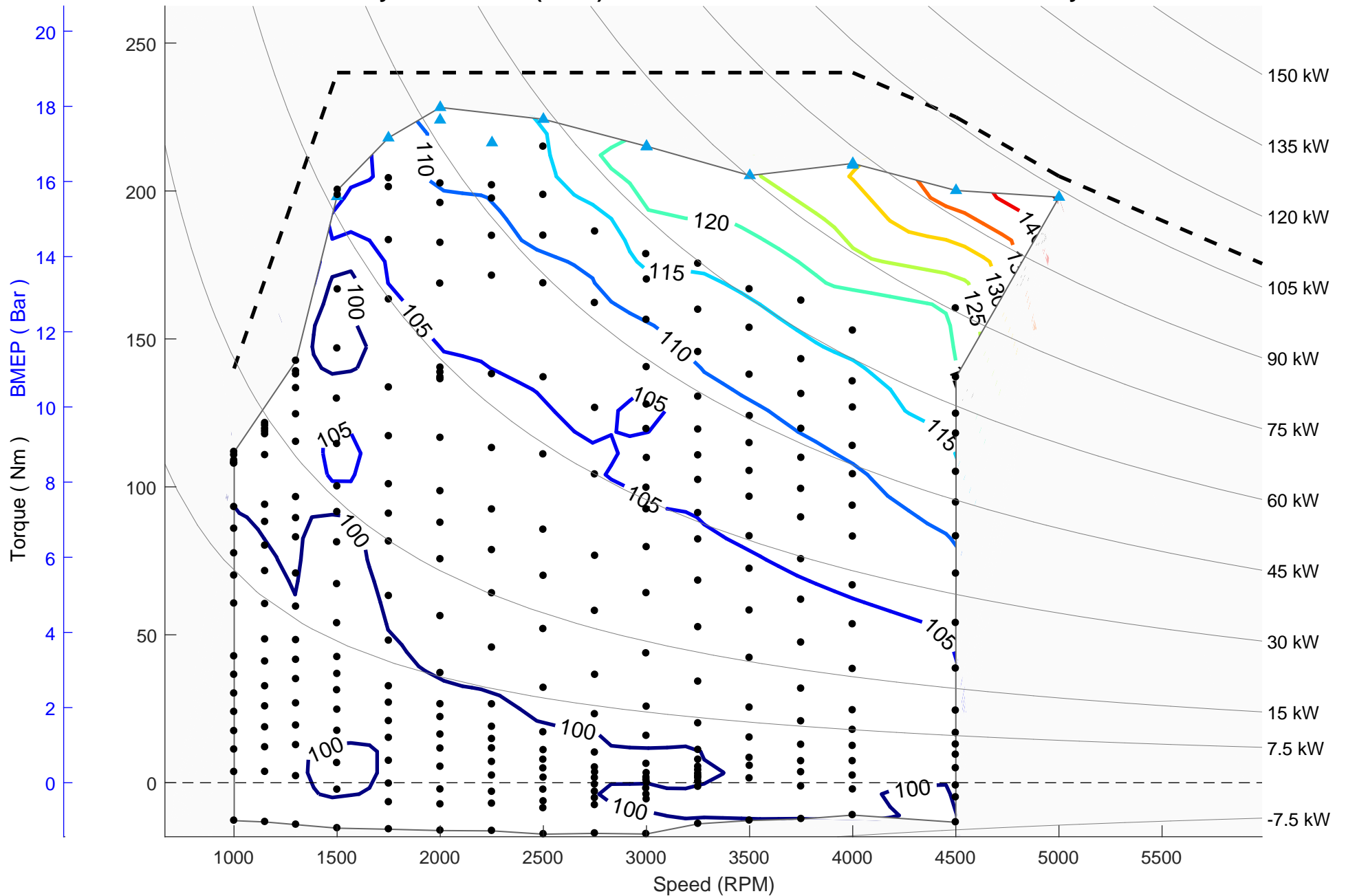


2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Turbine Inlet Temp (degC) - Temperature Measured at Turbocharger Turbine Inlet

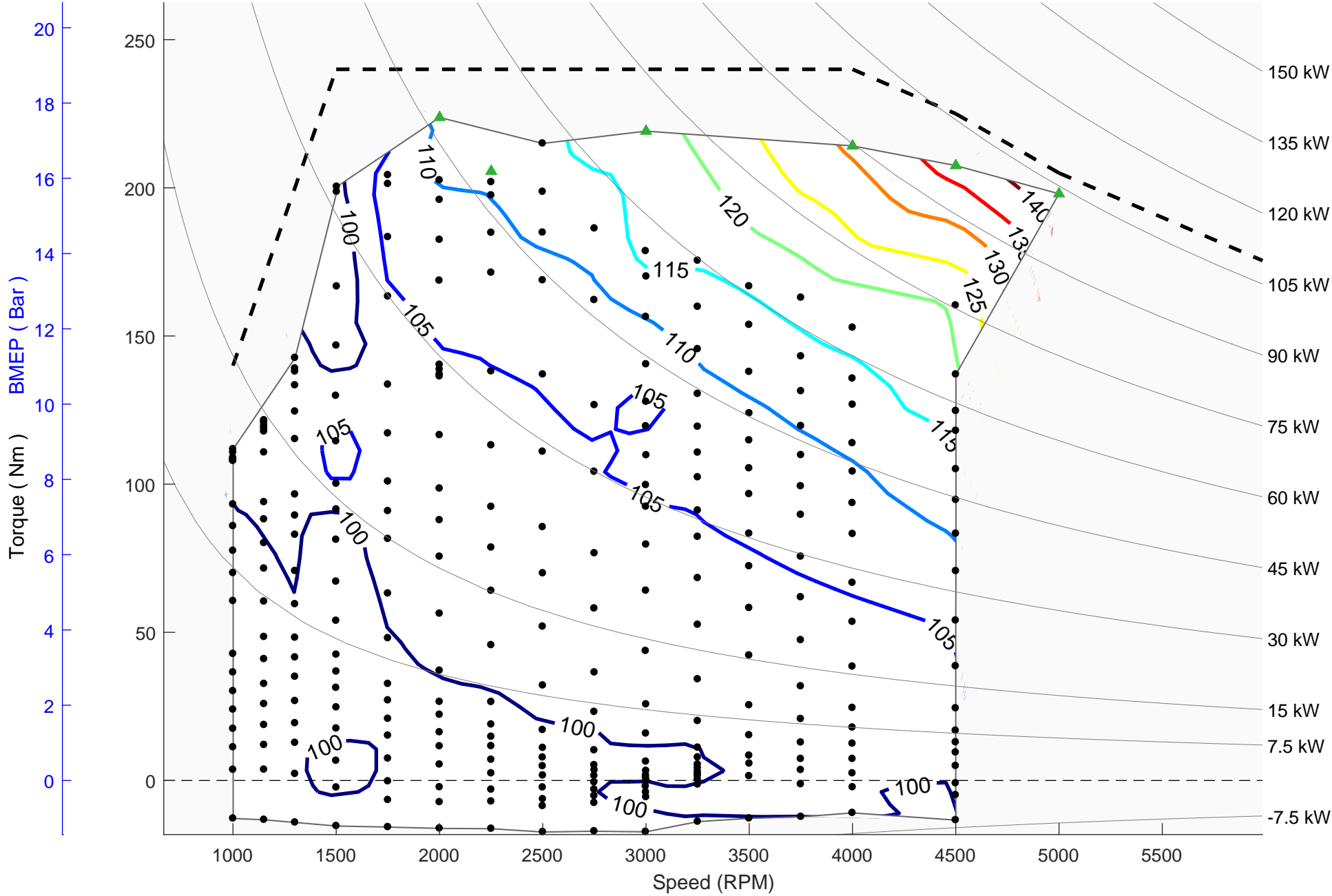


2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Turbine Inlet Temp (degC) - Temperature Measured at Turbocharger Turbine Inlet

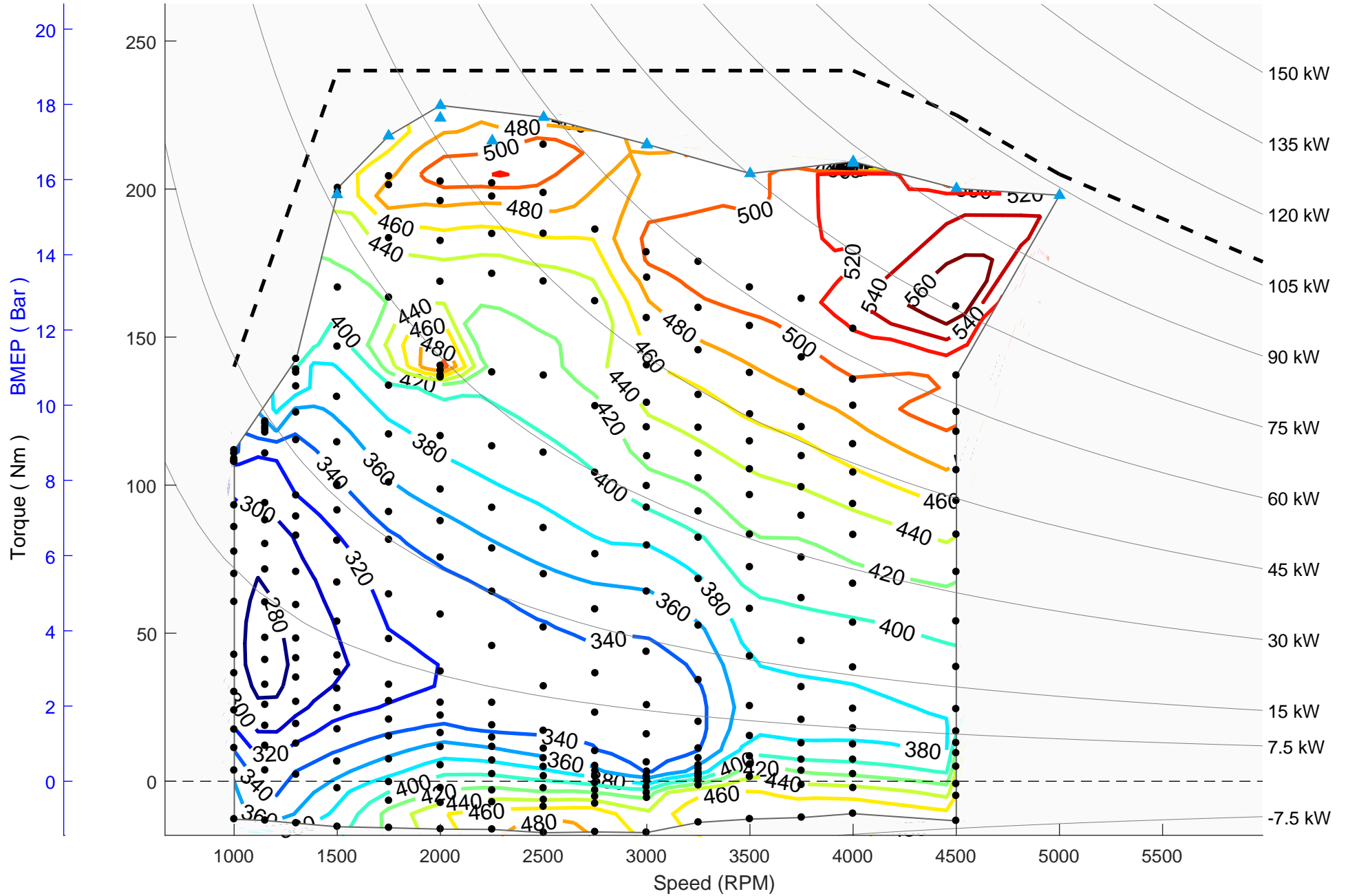




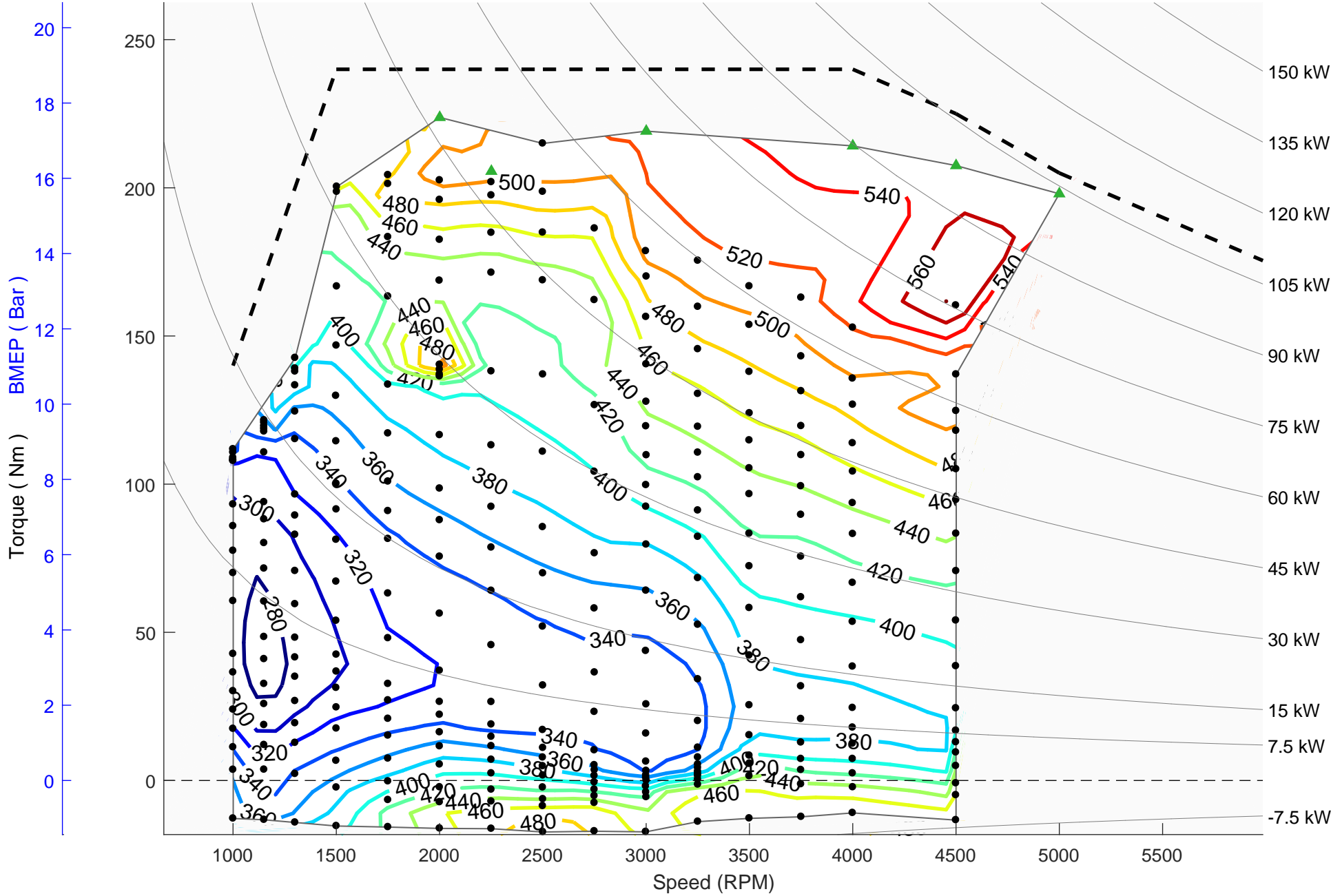
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Catalyst Inlet Press (kPaA) - Pressure Measured at the Inlet to the Catalyst



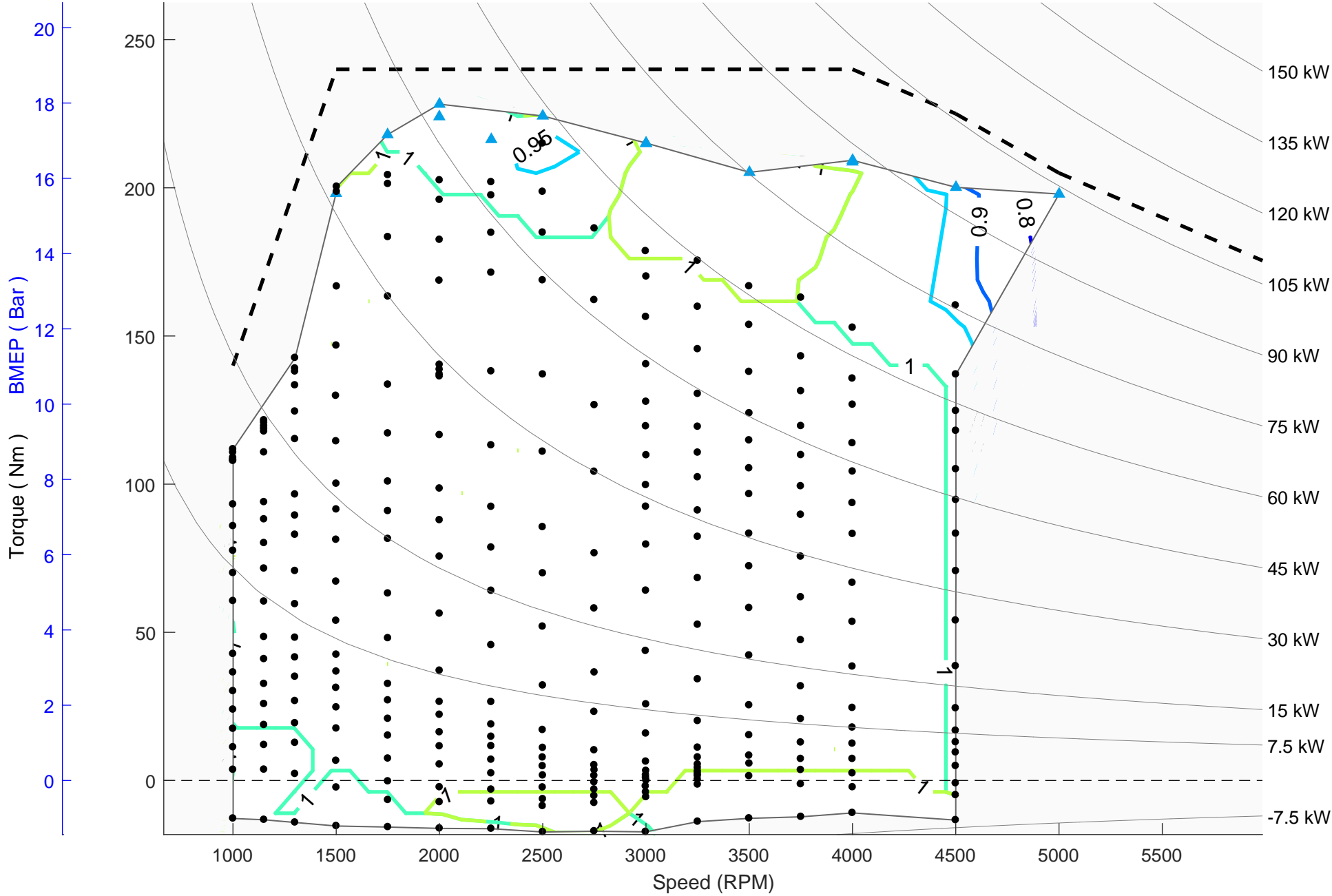
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Catalyst Inlet Temp (degC) - Temperature Measured at the Inlet to the Catalyst



2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Catalyst Inlet Temp (degC) - Temperature Measured at the Inlet to the Catalyst

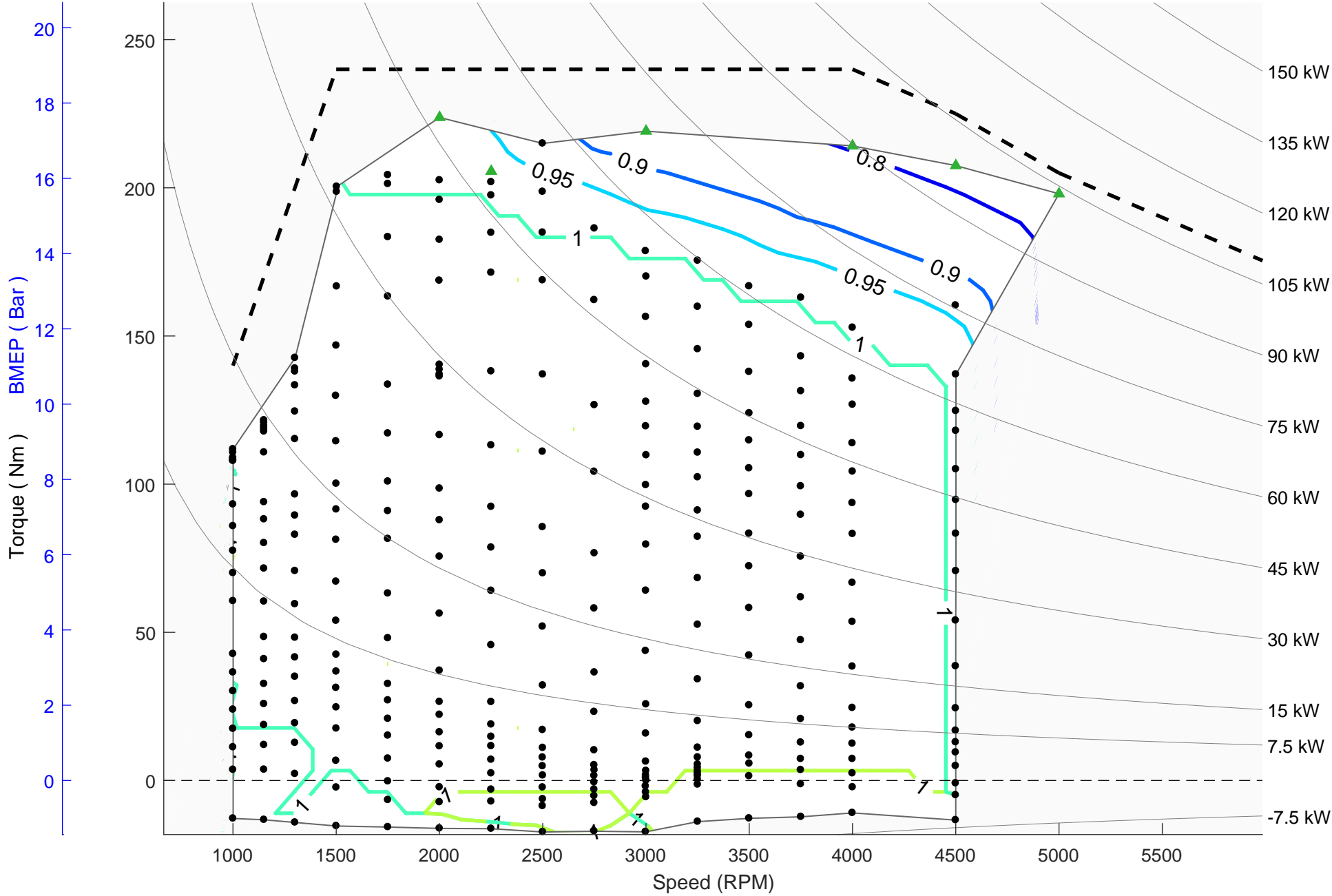


2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Exhaust Lambda - Measured via Wideband Exhaust Oxygen Sensor*



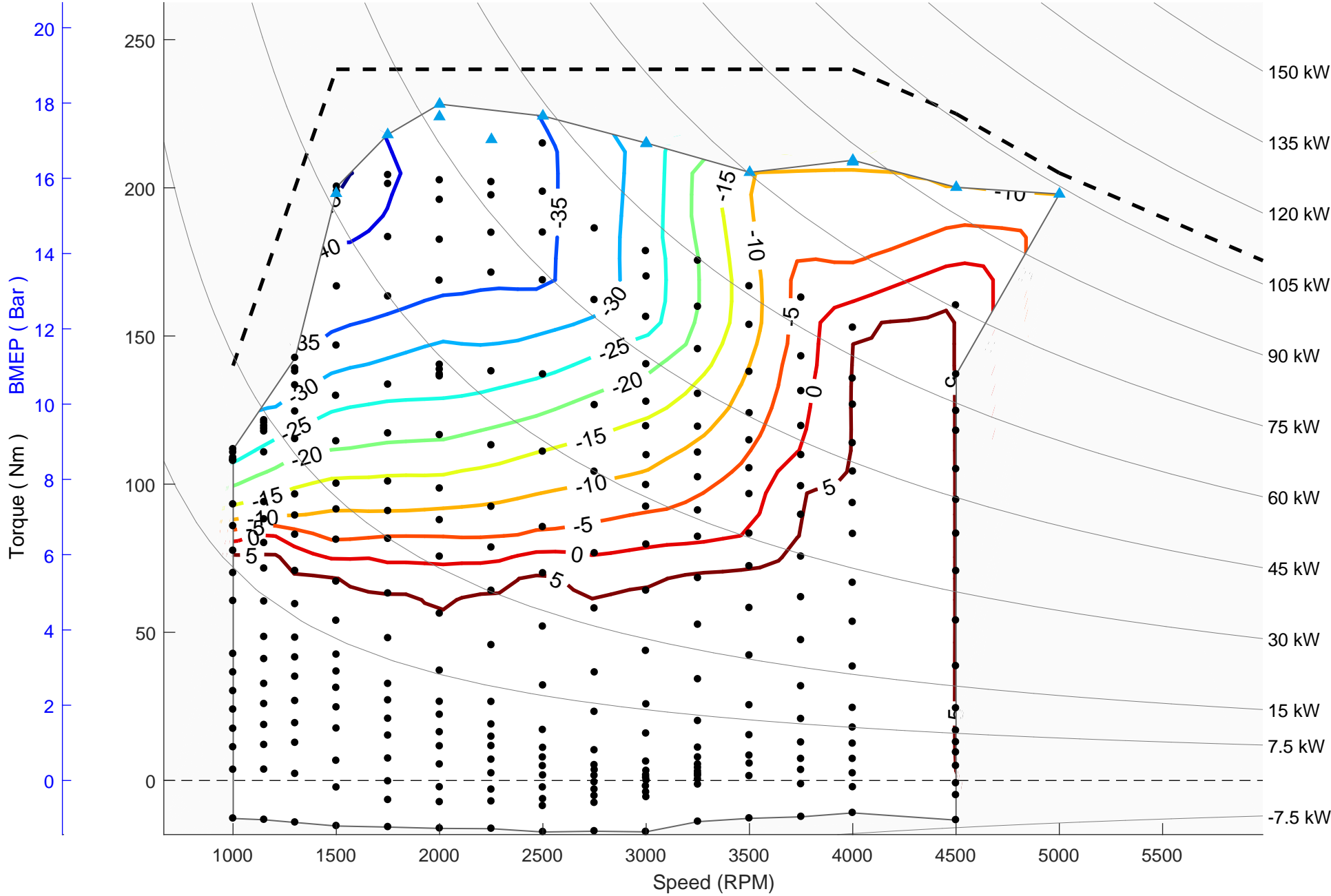
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2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Exhaust Lambda - Measured via Wideband Exhaust Oxygen Sensor*

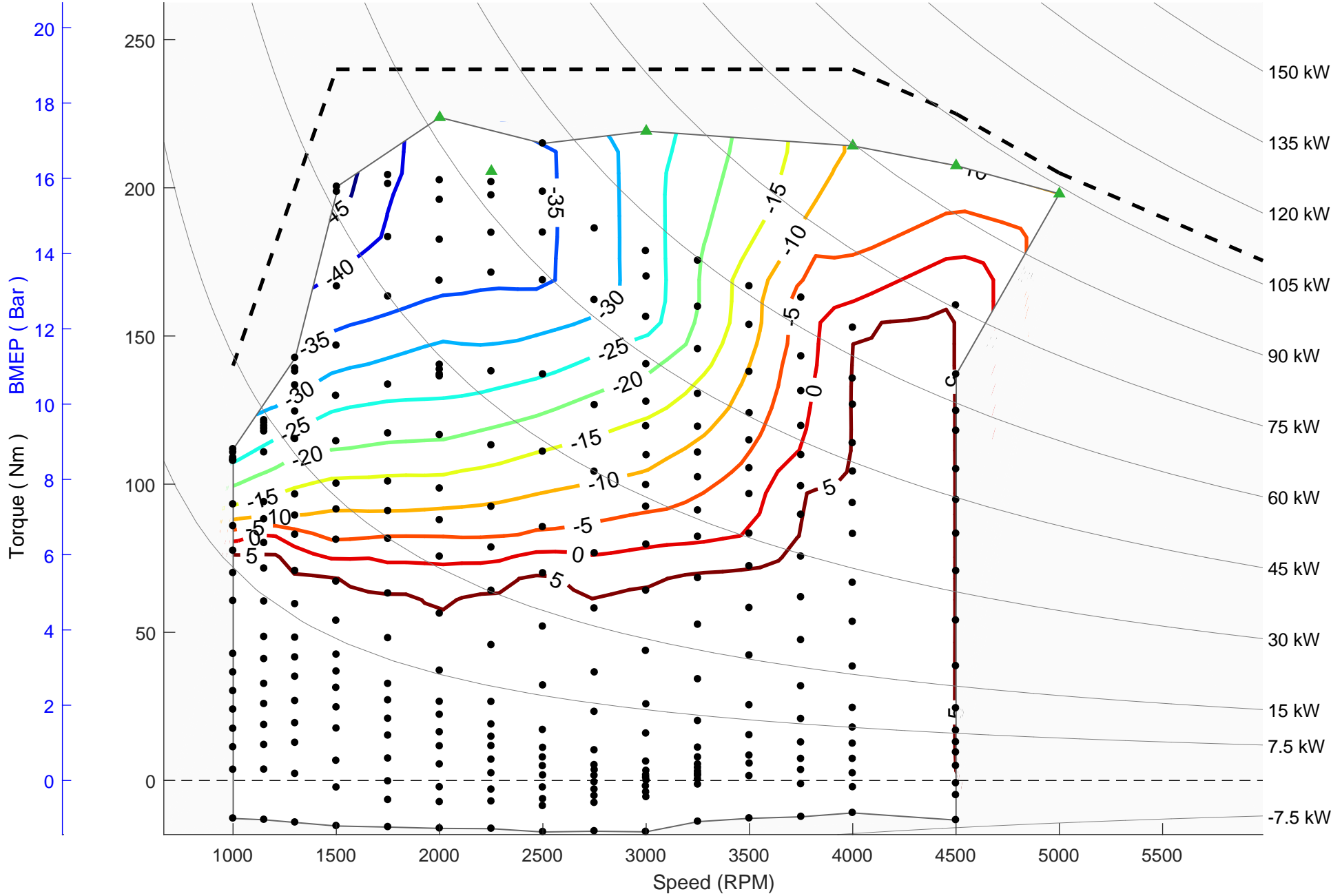


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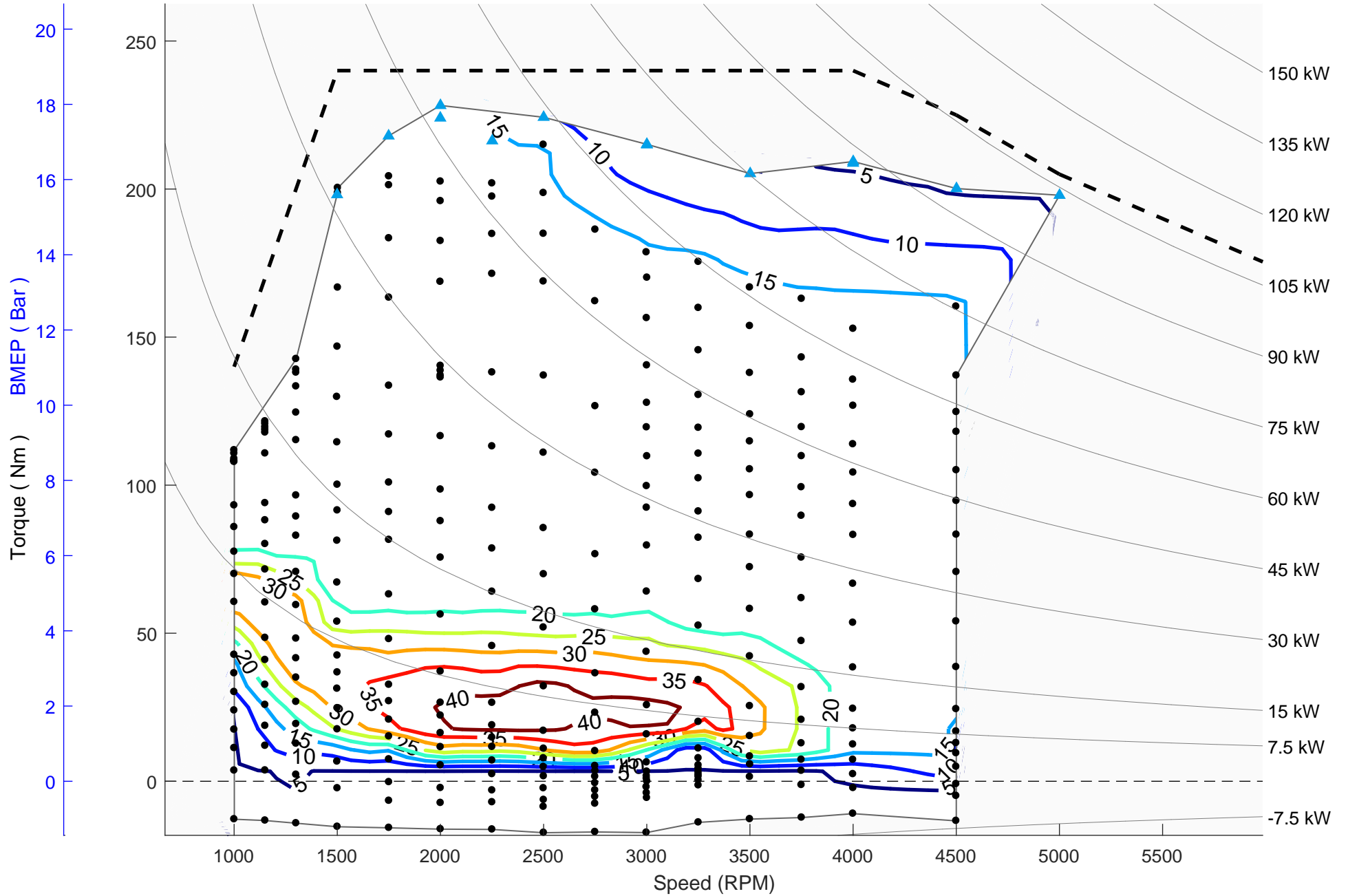
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Intake Cam Phase (CAD) - Intake Cam Phaser Retard



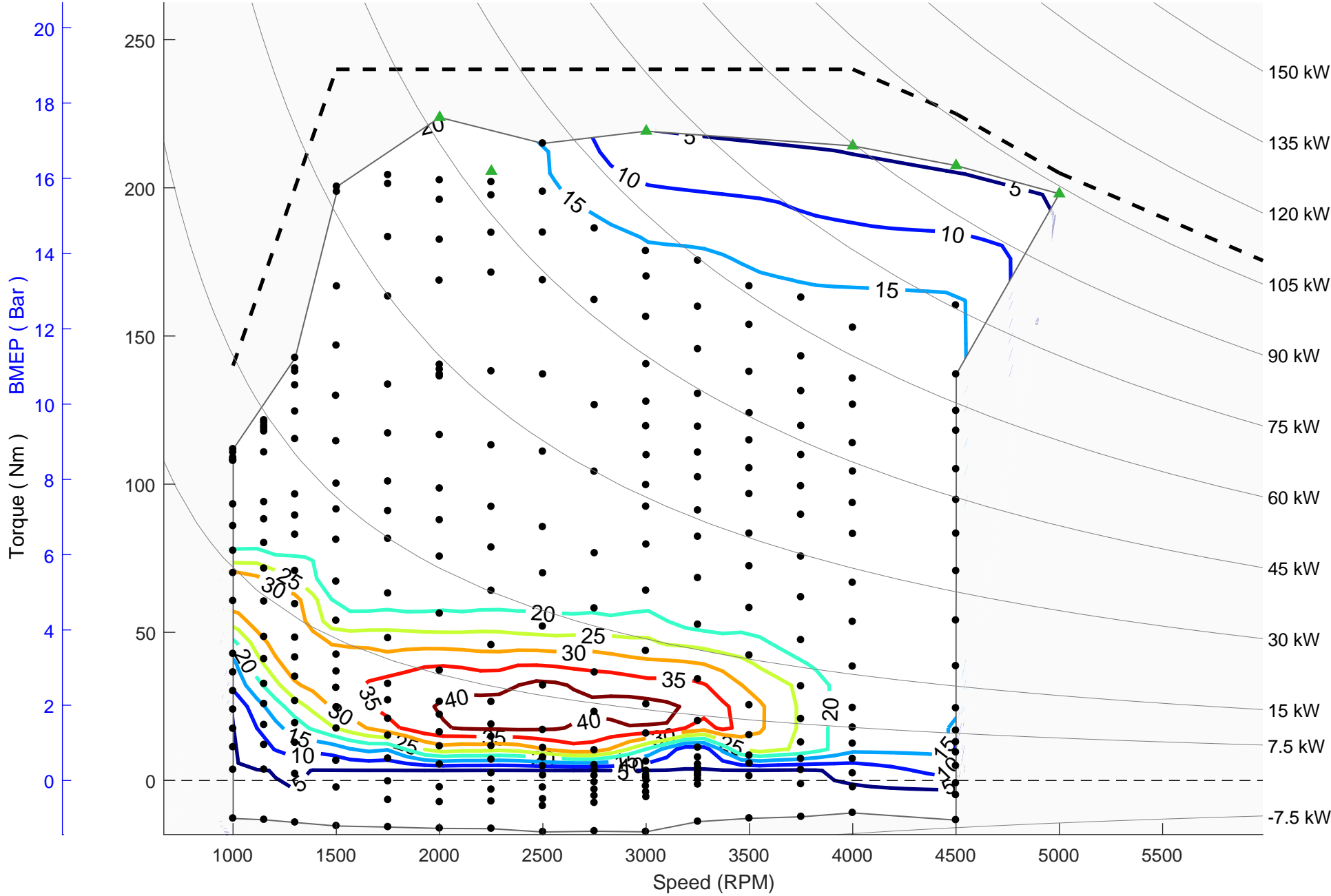
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Intake Cam Phase (CAD) - Intake Cam Phaser Retard



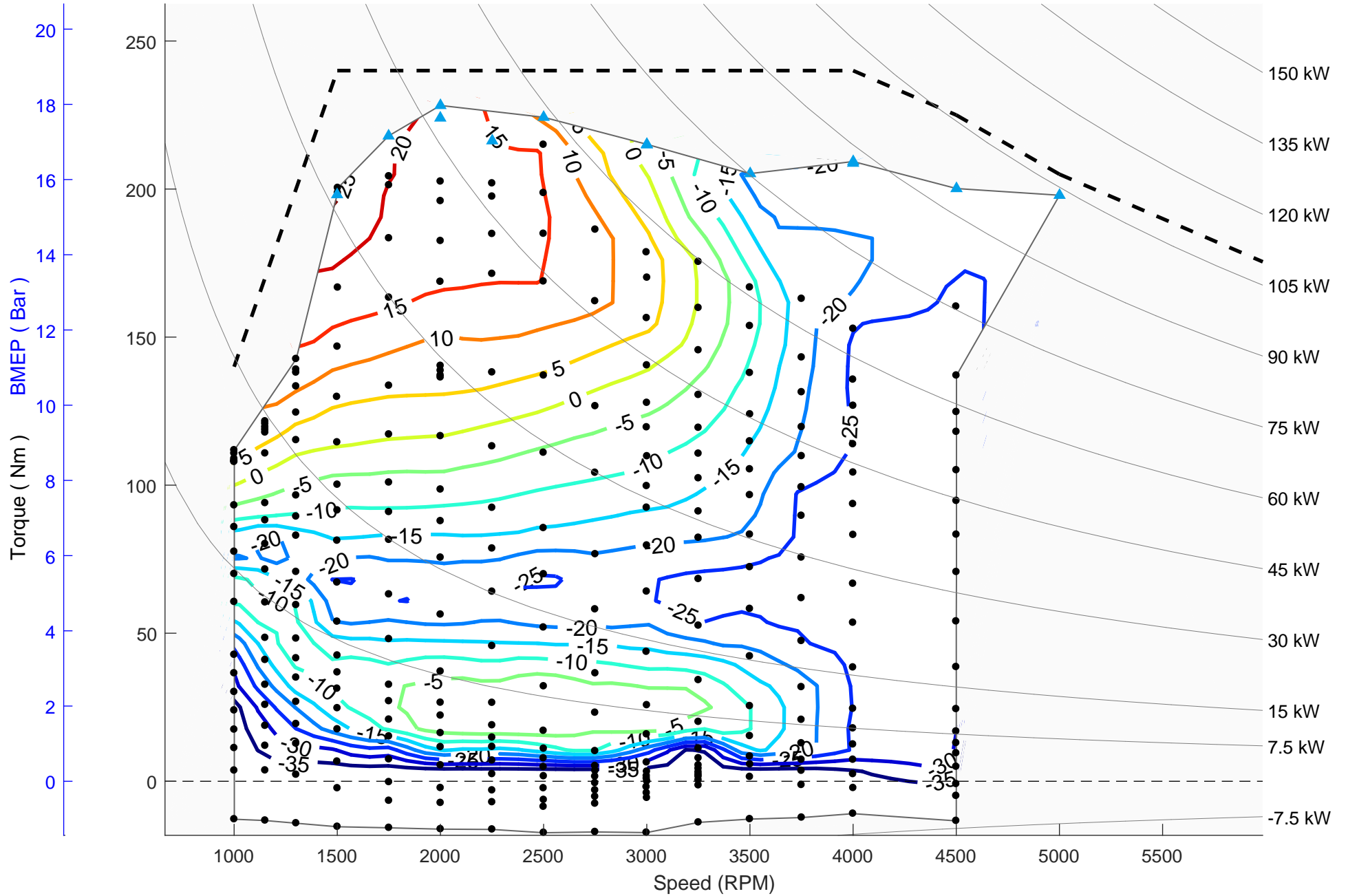
2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Exhaust Cam Phase (CAD) - Exhaust Cam Phaser Retard



2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Exhaust Cam Phase (CAD) - Exhaust Cam Phaser Retard



2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Initial
Valve Overlap (CAD) - Estimated Valve Timing Overlap from Cam Phase Measurements



2013 Ford 1.6L EcoBoost Engine LEV III Fuel - Test Data Plots
Steady State and High Load Final
Valve Overlap (CAD) - Estimated Valve Timing Overlap from Cam Phase Measurements

