MathWorks

MATLAB&SIMULINK

Solving Data Analysis Challenges Using MATLAB and Statistics Products

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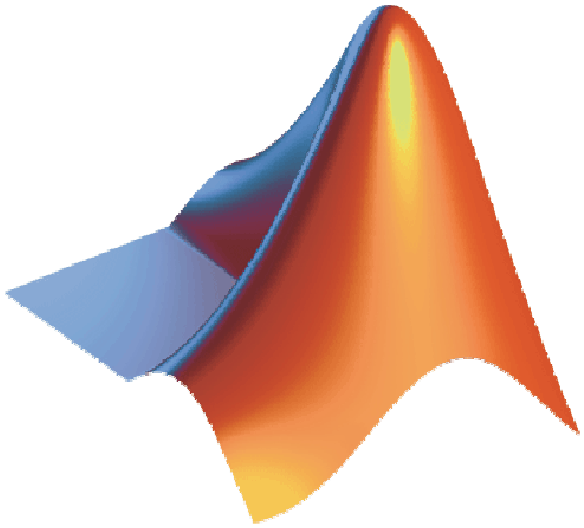
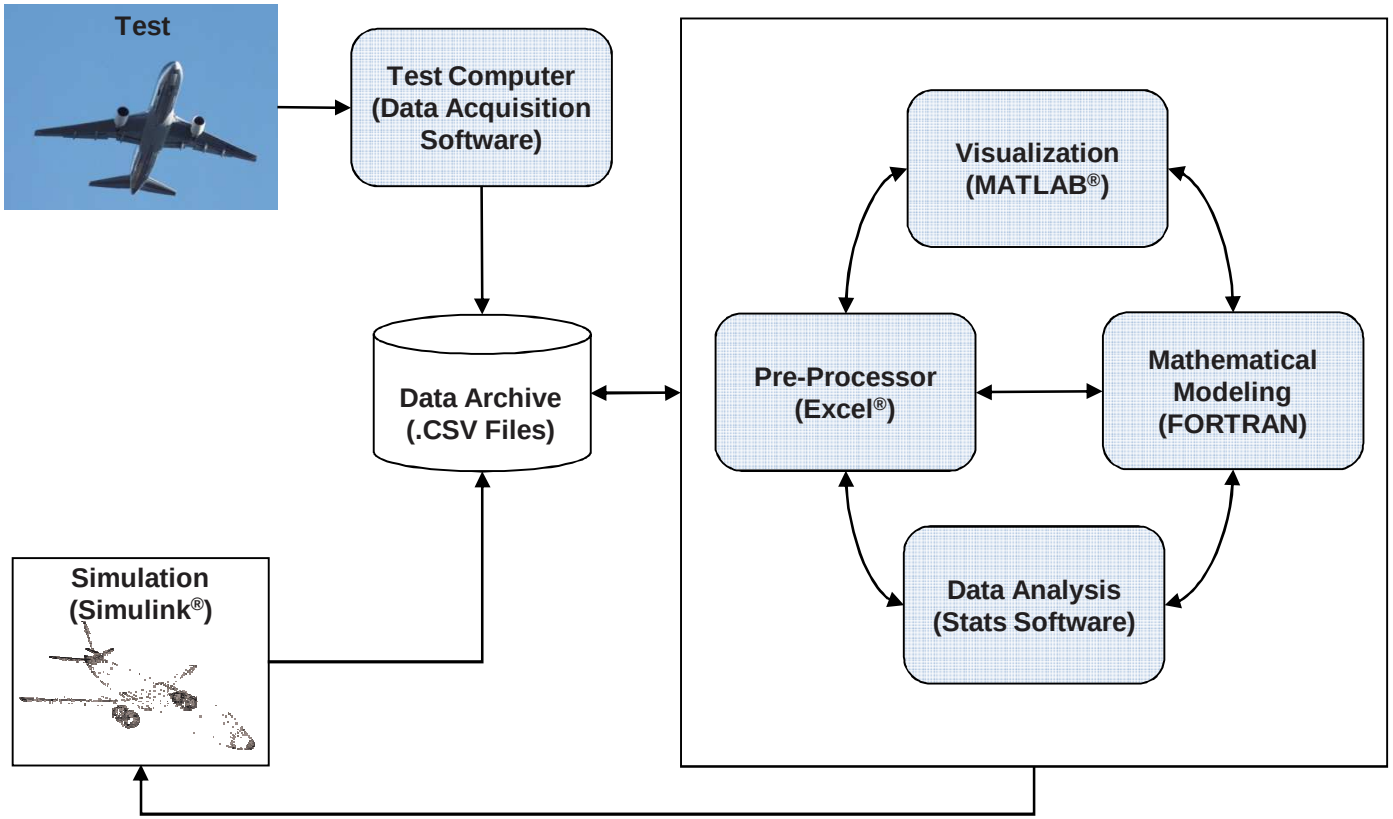
Agenda

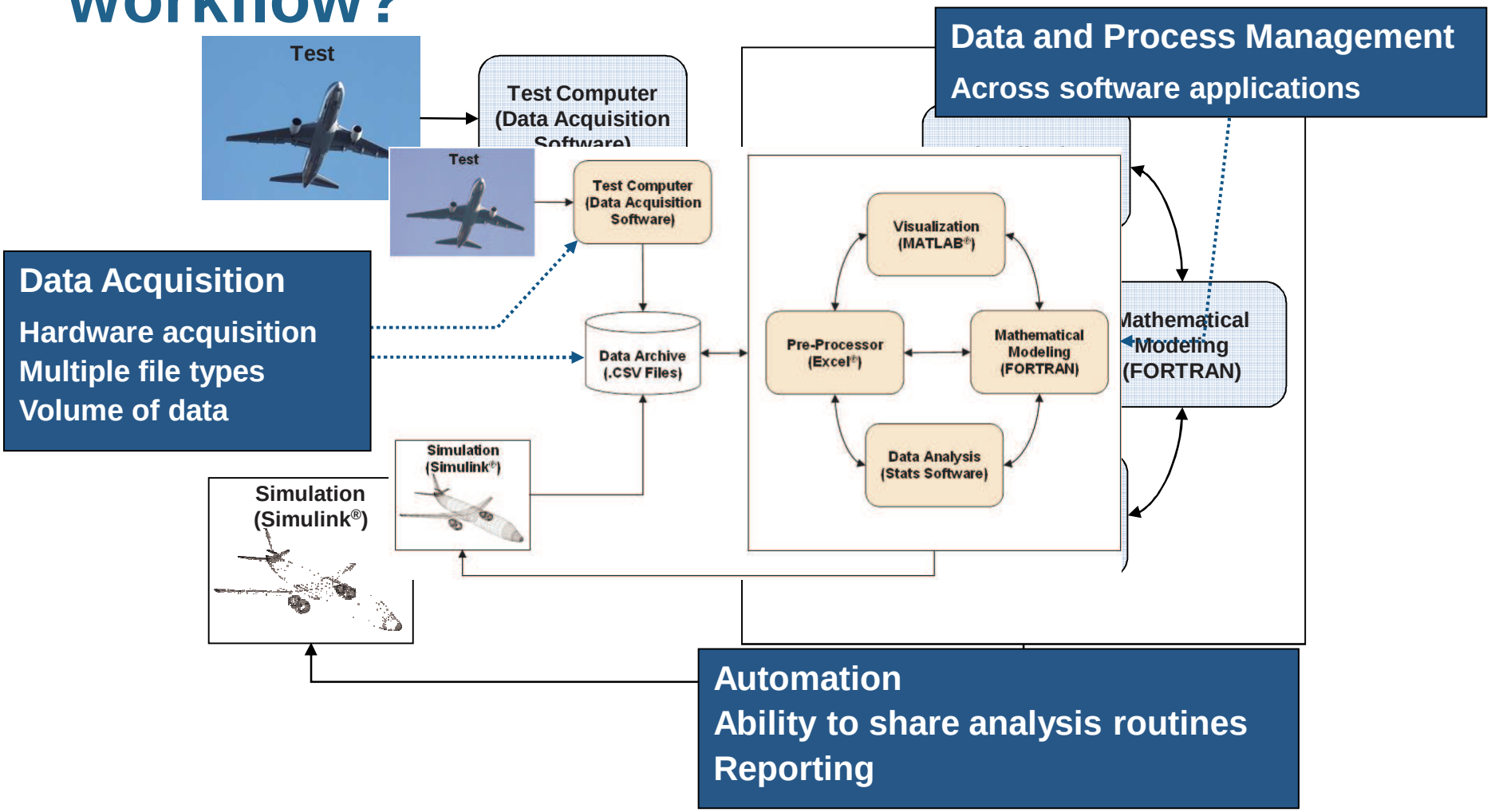
- Example data analysis workflow
- Demonstration: Analysis of aircraft wing stress
- Summary
- Question and answer



Example Data Analysis Workflow

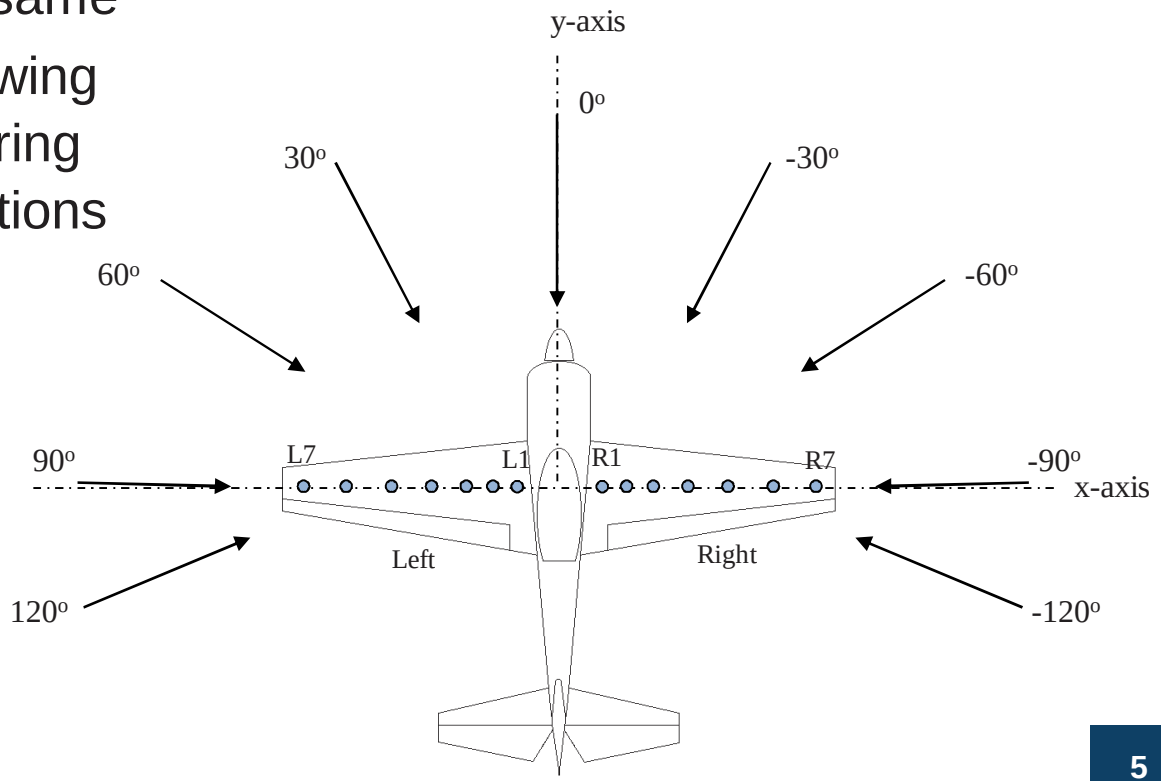


What are the challenges in this workflow?



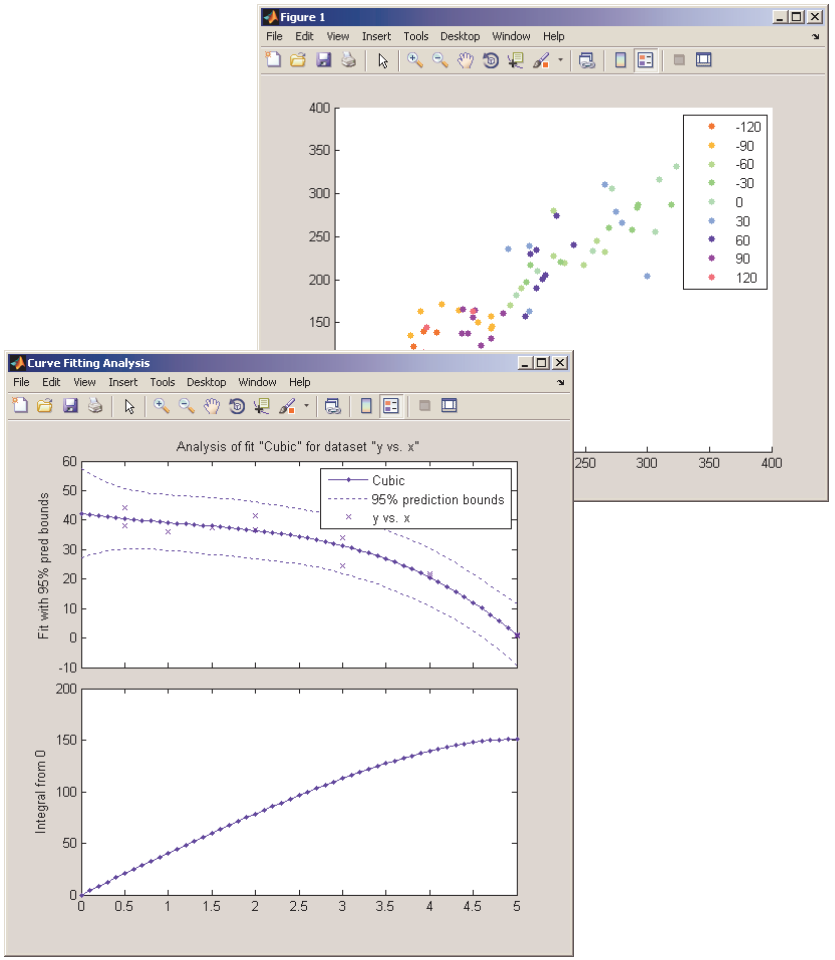
Demonstration: Wing Stress Analysis

- Determine if:
  - Stress levels on left and right wings are the same
  - Shear force on the wing exceeds 160 kN during extreme wind conditions

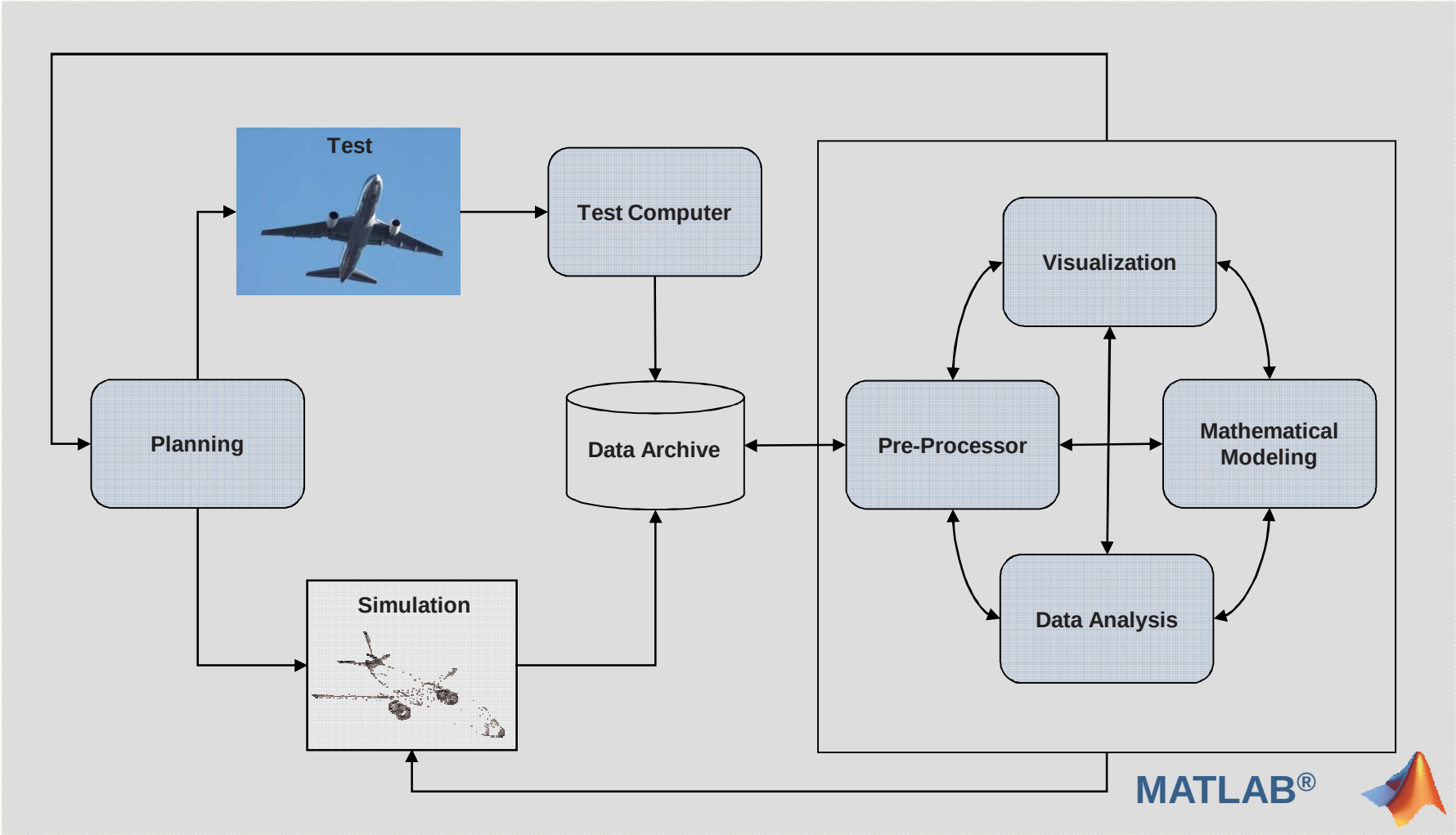


Summary – Wing Stress Analysis

- Imported and visually inspected data
- Used statistics functionality to support the analysis
  - Hypothesis testing
  - Dataset and categorical arrays
  - Specialized visualizations and analysis techniques
- Used curve fitting analysis to estimate shear force



Summary

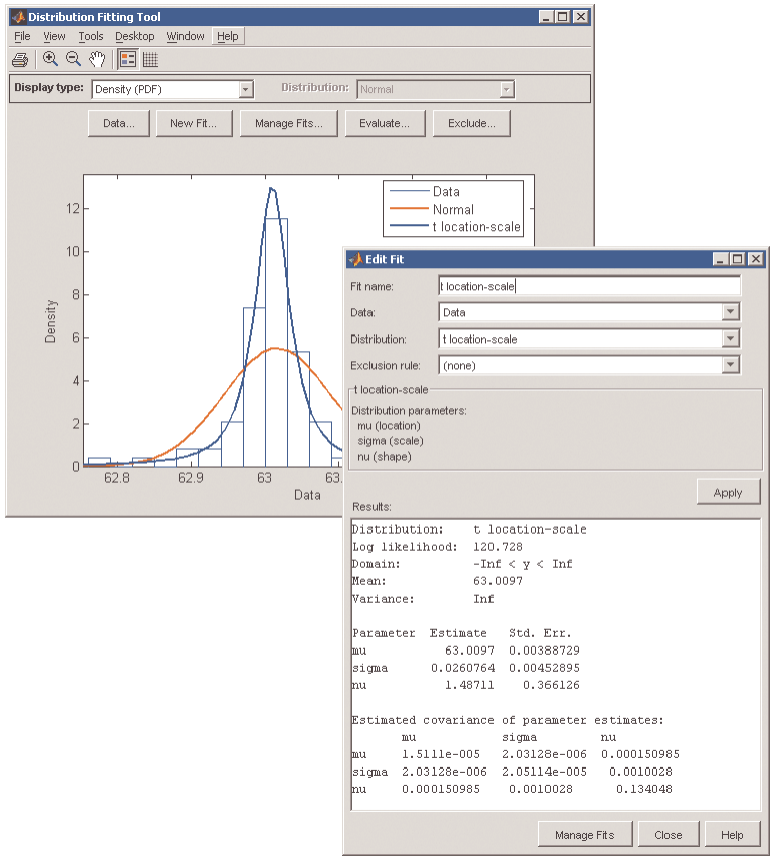

Test
Test Computer
Visualization
Planning
Data Archive
Pre-Processor
Mathematical Modeling
Simulation
Data Analysis
MATLAB®

Questions?

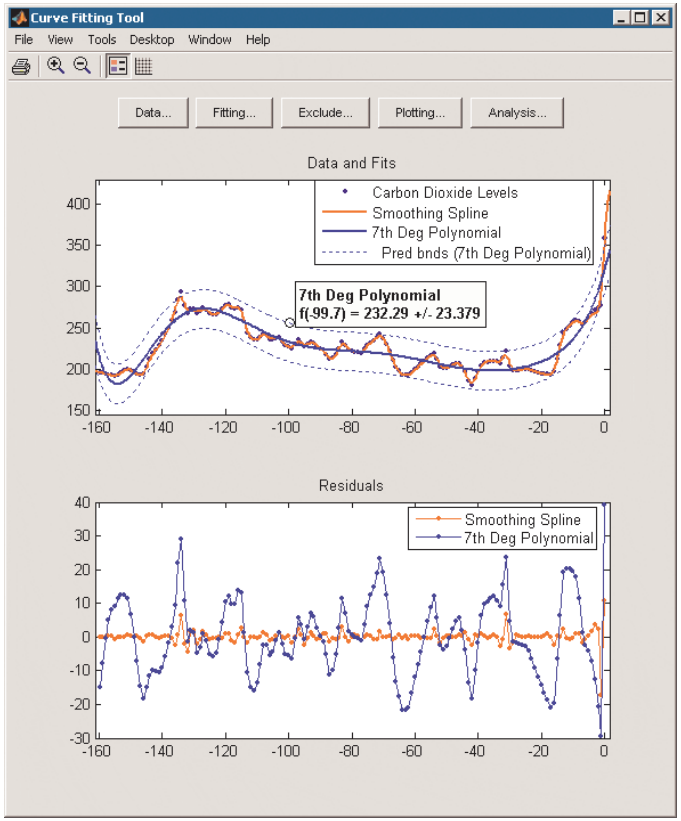
Statistics Toolbox

Statistics Toolbox provides interactive and command line tools for:

- Data collection and management
- Descriptive statistics
- Multivariate statistics
- Probability distribution fitting and modeling
- Hypothesis testing
- Analysis of variance/covariance
- Linear and nonlinear modeling
- Visualization
- Statistical Process Control



Curve Fitting Toolbox

Graphical user interface and command line functions for:

- Previewing and preprocessing data
- Developing, comparing, and managing models
- Extensive library of linear, nonlinear, and nonparametric models
- Customizable model fitting
- Interpolation, extrapolation, differentiation, and integration