FastBike

A Multiboby Software for the Analysis of Motorcycle Dynamics

DYNAMOTION

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A virtual model to solve real problems

Type of problem		Type of simulation
Trim		• static • steady state
Stability		• eigenvalues • time simulation
Handling		• time simulation • FRF • steady state

Overview

- **Standard bodies**
  (chassis, front assembly, wheels, etc.)
- **Additional bodies**
  (bags elastically suspended, etc.)
- **Several suspension linkages**
  (swingarm, fork, paralever, duolever, telelever)
- **Frame and suspensions compliances**
- **Non-linear spring-shock**
- **Deformable tyre**
- **Detailed chain/shaft transmission**
- **Easy to use Graphical User Interface**
- **…and many more**

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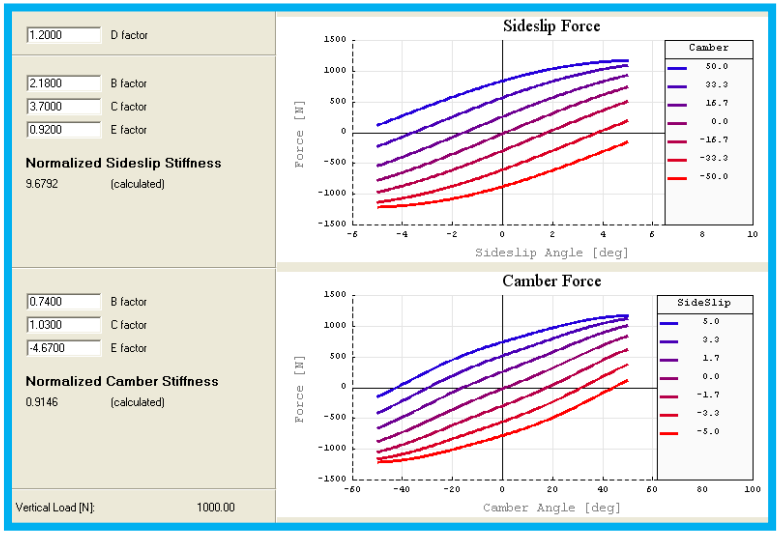
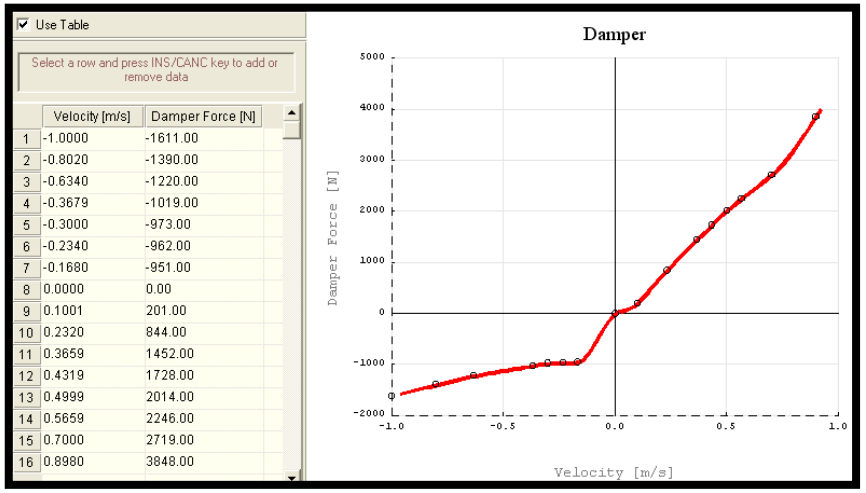
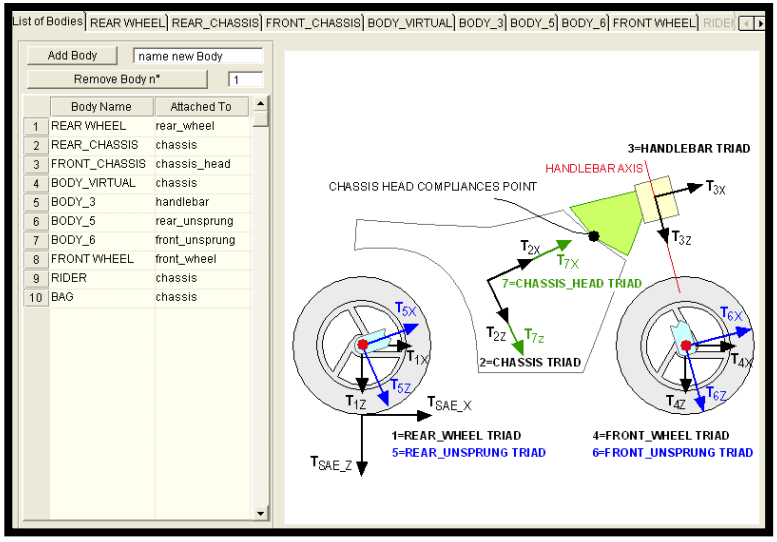
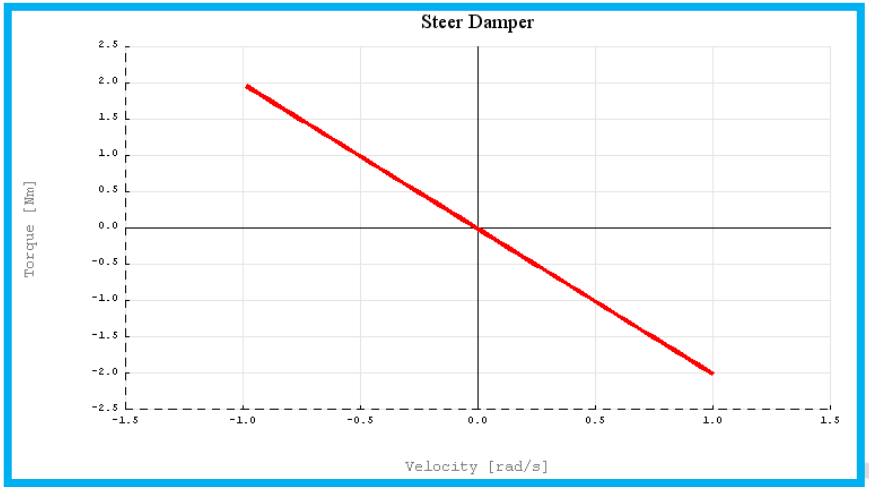
GUI: to easily set motorcycle parameters

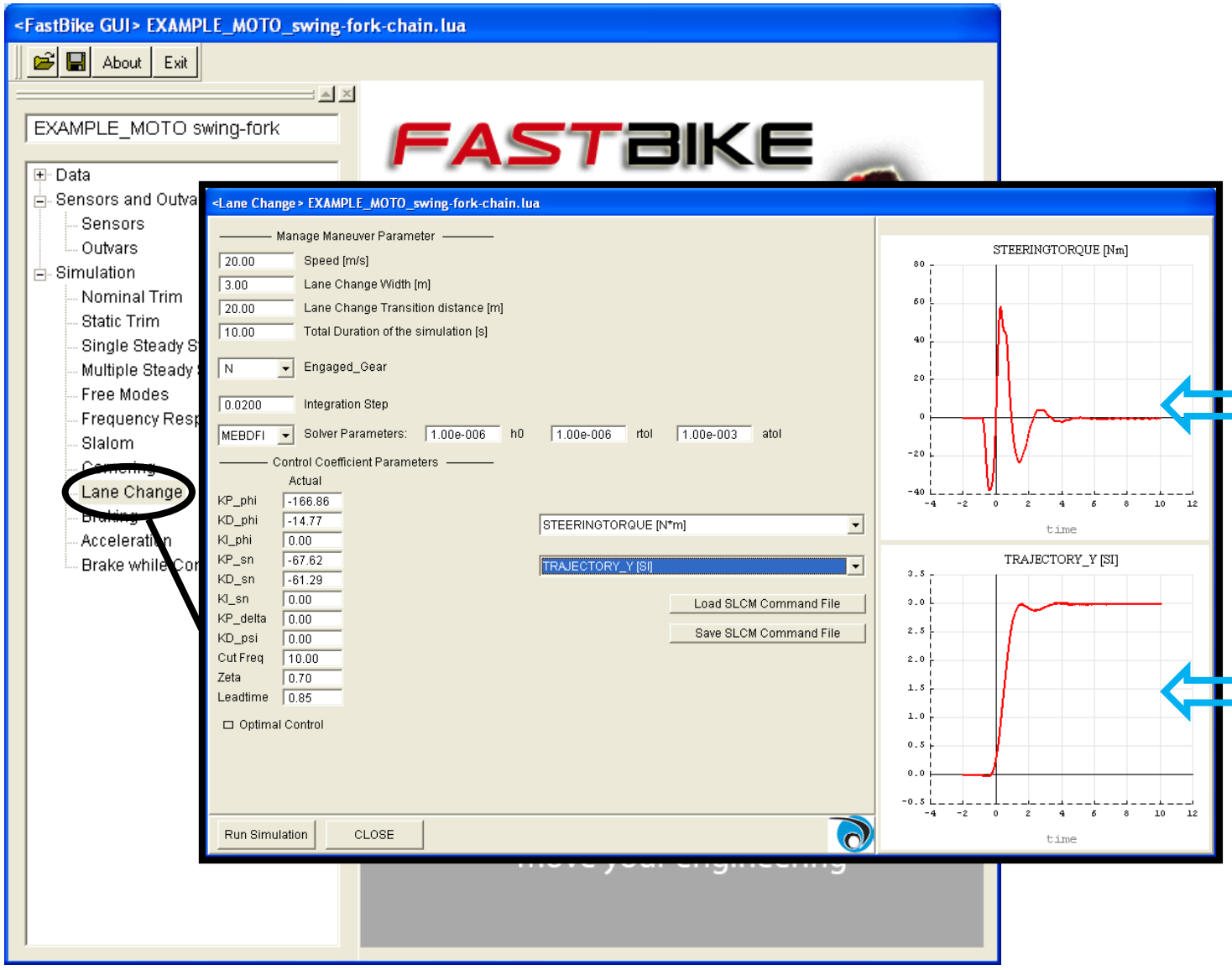








GUI: handling analysis



- STEERING TORQUE
- BRAKING TORQUE
- ENGINE TORQUE
- TYRE FORCES
- …

- TRAJECTORY
- SPEED
- ROLL
- YAW
- …

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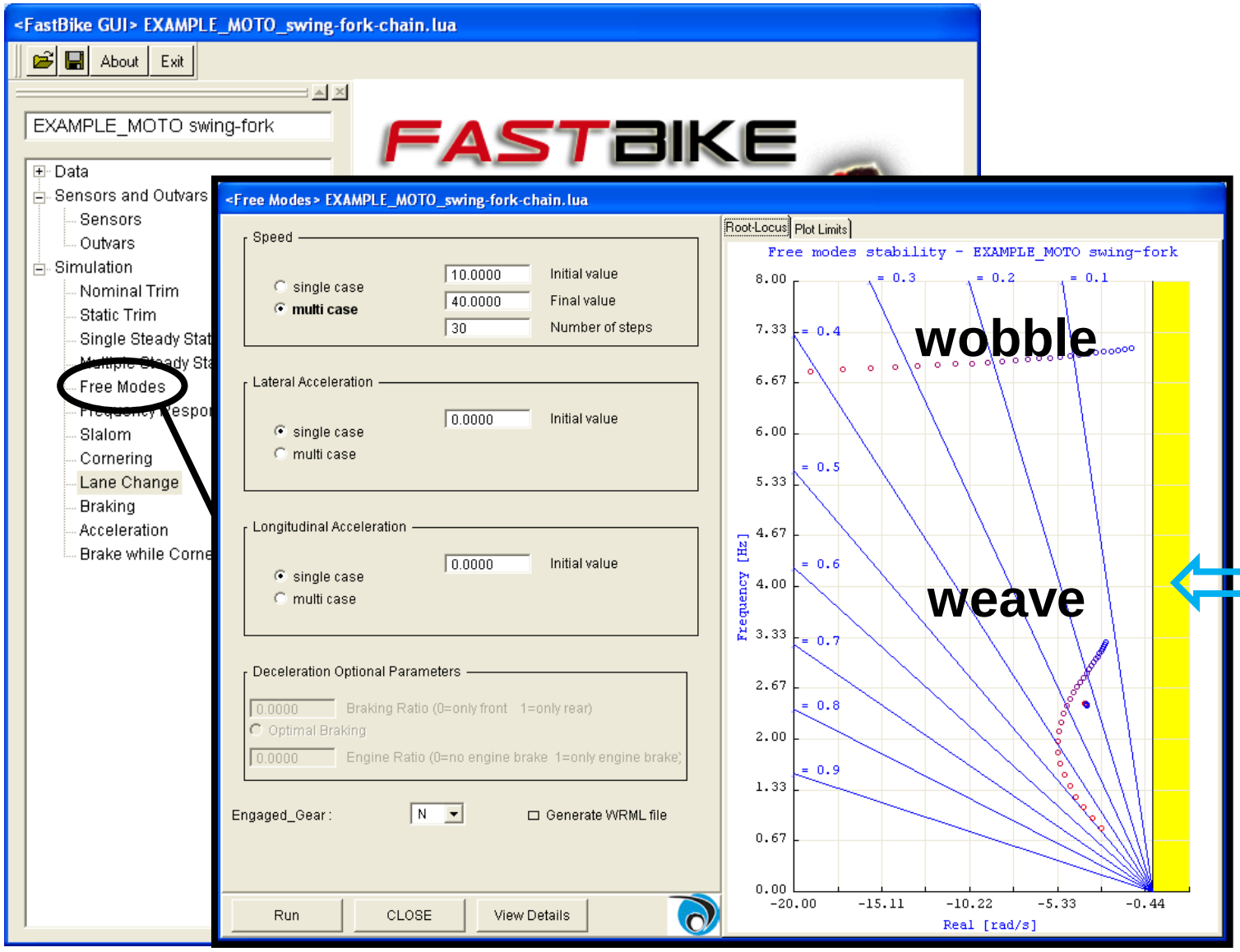
GUI: modal analysis



- FREQUENCY
- DAMPING RATIO
- MODAL SHAPE
- …

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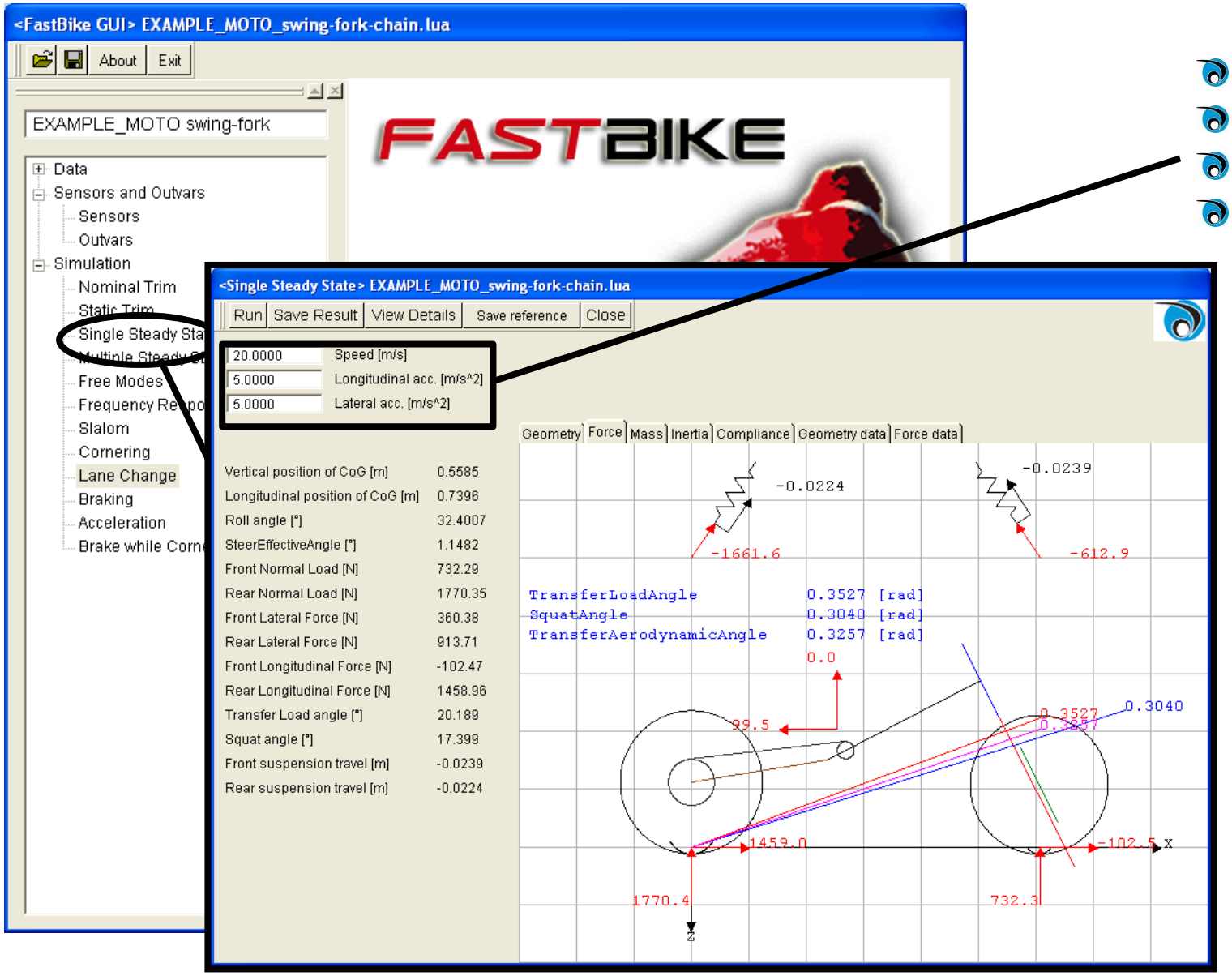
GUI: steady state trim



- DIFFERENT SPEED
- CORNERING
- ACCELERATING
- BRAKING

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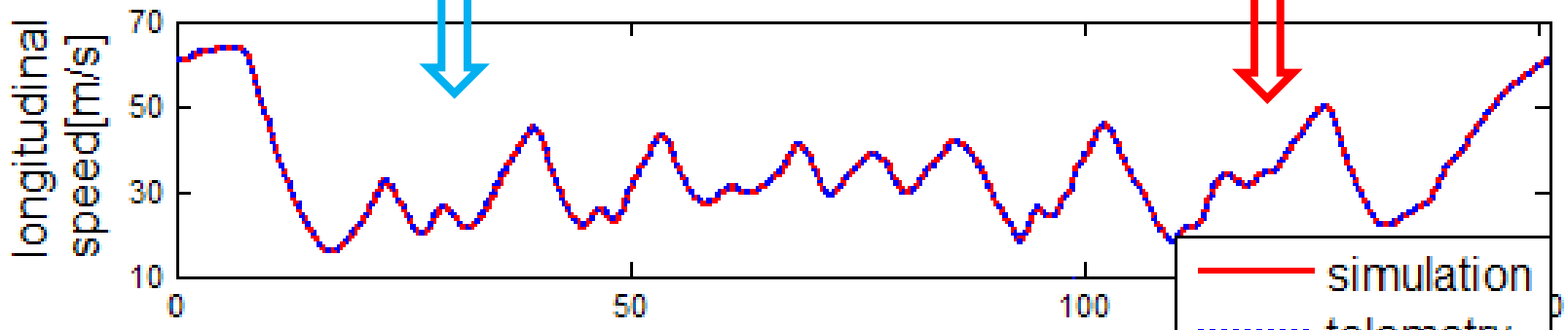
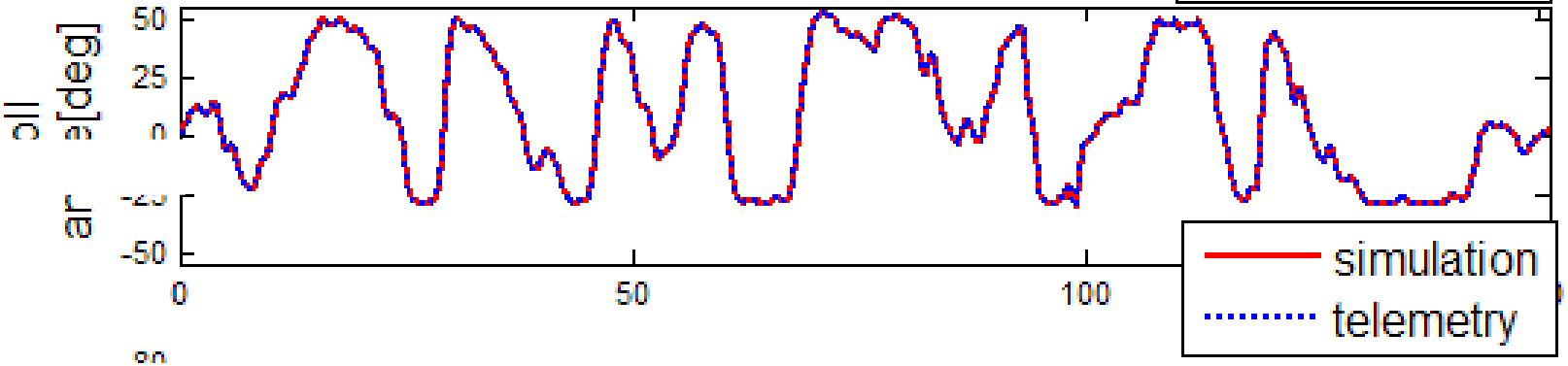
FastBike is consistent with Road Tests





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Packages

Trim	[STC] . Static Trim Calculation [SSA] . Steady State Analysis
Stability	[FMS] . Free-Motorcycle Stability [FRF] . Frequency Response functions
Handling	[CSLC] . Control Synthesis for Lane Change [CSS] . Control Synthesis for Slalom [CSC] . Control Synthesis for Cornering [SLCM] . Simulation of Lane Change Maneuver [SSM] . Simulation of Slalom Maneuver [SCM] . Simulation of Cornering Maneuver
In-Plane Dynamics	[BFR] . Braking on a Flat Road [AFR] . Acceleration on a Flat Road [FRF] . Frequency Response functions