META Post-Processor Toolbars for Crash and Safety

Introduction

The ever-increasing workload and demand to meet strict deadlines has necessitated the automation of modern CAE software. Experience has proven that particularly for crash and safety analyses which can involve hundreds of different runs, the processing of these runs' results and the subsequent generation of a complete report is a very tedious and time-consuming task. Thus, introducing, in this part of the design cycle, software with advanced automation capabilities can have a significant impact on reducing the lead times.

Automation Capabilities in META

META covers the above requirements through an array of advanced automation capabilities which include:

- BETA scripts,
- META session files
- User Toolbars

BETA scripts are text codes based on the C programming language which allow for unparalleled model data gathering and process automation.
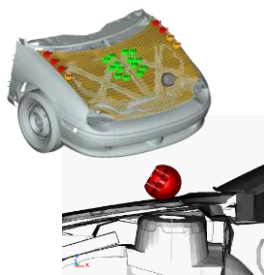
META session files are text files. They are a sequence of META-commands that can be parameterized and executed silently to perform repetitive and time-consuming processes without manual intervention.

User toolbars are custom graphical user interfaces created within META, using the dedicated *Toolbar Designer*. Taking advantage of the automation capabilities of both BETA scripts and μETA sessions, user toolbars can be created as discipline and process-specific to contain only the necessary functions. Additionally, they can be shared between different work-teams.

META toolbars

Available with every META Post installation, an assortment of default user toolbars can also be accessed by any user of META. Particularly, for LS-Dyna and LS-Opt, the user toolbars that exist are the following.
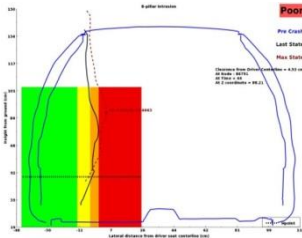
Pedestrian

- Headform, legform and upper leg testing
- Custom settings for plots, videos and criteria limits
- User-defined and default fringebars (EuroNCAP grid colors, etc)
- Overview through annotations and mapping of values on the model
- Videos of model clipped by planes or of model sections
- EuroNCAP score calculation
- Automatic pptx/html report creation even in batch mode
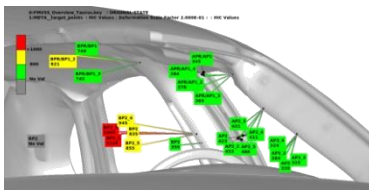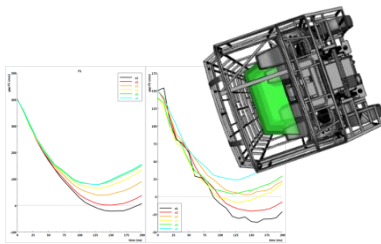- Use of pptx master slide and custom slide layouts

IIHS

- Front Impact : measurement of intrusion into occupant compartment
- Side Impact : measurement of intrusion into occupant compartment around the B-pillar
- Roof Impact : strength-to-weight ratio plot
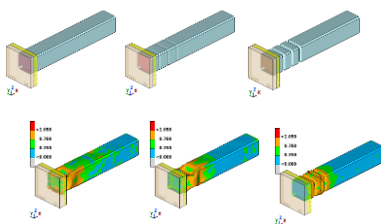
FMVSS_201U

- Automatic creation of pptx report
- 2d plots with HIC value / acceleration to intrusion
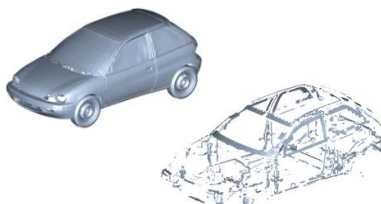- Video animation of the impact

BusRollover

- Calculations according to regulation ECE R66
- Easy definition of the sections where the intrusion will be measured
- Automatic calculation of the intrusion in the survival space at each section

OptimizerSetup

- Helps integrate META in optimization loops
- Successful integration to the LS-Opt, Optimus and ModeFrontier codes
- All necessary settings within a single interface, so it is easy for inexperienced users to quickly set-up the process
- Design responses and histories can be output in a standard format file

Collision-Penetration Check

- Calculation and visualization of penetrating areas between different models or within the same model
- Penetration on element intersections or on property-thickness level
- Automatic creation of separate penetrating element groups for each state

physics on screen

Benefits:

User toolbars offer:

- Process automation
- Guidance in performing tasks in a fail-safe, step by step manner
- Customization ability to suit any user or process requirement

The default toolbars, available with META, have been developed with the close collaboration and supervision of major OEMs, so their regulation conformance is guaranteed and their advantages in boosting productivity proven through real-life situations.

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physics on screen