

## **TYRE FEA MODELLING USING ANSA & META**

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### **KEYWORDS –**

Tyre, ANSA, META, Abaqus

### **ABSTRACT**

Over the last decades, tyre companies are using FEA methods to reduce the product development time and reach the market requirements. By using advanced multi-purpose FEA software, the engineers are able to succeed the above goals. In this paper, the most common tyre simulations are presented. The ANSA pre-processor is used for the complete preparation of the tyre for the Abaqus solver (2D meshing, 3D meshing, solver setup etc). Another big advantage of ANSA is the automation capability that can be applied in this process. The simulation types that will be presented are:

- Tyre axi-symmetric modelling
- Tread pattern Hex mesh
- Postprocessing of Static loading of tyre
- Coupled air-tyre modal results post-processing
- Tyre Modal Model preparation
- Modal response and Modal/FRF correlation
- Cleat impact analysis setup and post-processing
- Tyre hydroplaning analysis setup and post-processing
- Automation of pre-processing of tyre curing process
- Tyre exterior noise radiation analysis using Actran
- CFD analysis for air-flow around the tyre

For all the above simulations, the results will be evaluated in the META post-processor. The continuous developing that has been done the last years, in order to support all the needed keywords for the tyre modelling in ABAQUS, provides the ability to set-up several kind of tyre simulations through the BETA suite.