Effects of Tire Reinforcement Material Properties and Operating Conditions on the Tire Cornering Characteristics

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Abstract:

Tire forces (lateral), moments, and rolling resistance are important aspects of tire characteristics. It is normally influenced by many factors including but not limited to tire type and size, vertical load and speed, inflation pressure, road condition, tire design parameters and tire reinforcement material properties. In this extensive research study, effect of tire reinforcement material and geometric properties, and tyre operating conditions including speed, inflation pressures and load on the tire is investigated and different tire characteristics are considered. 3D finite element based parametric analysis using ABAQUS software is conducted by taking a 17inch (225/55/R17) radial car tire for range of operating conditions and design parameters.

Keywords:

Tire forces and moment, Tire cornering characteristics, Tire reinforcement material properties, Tire Design parameters.