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Short Communication

Optimizing the vehicle's tire material for improving the vehicle handling attributes

Mahsarahimbeigi

, School of automotive engineering, Iran University of Science and Technology, Tehran

Abstract

The tire characteristics are significantly effective on the vehicle dynamic attributes including ride and handling. The relation between the tire structure and compounds with the vehicle handling and stability is an important relation that can be very effective in the vehicle performance. The purpose of this study is to optimize the vehicle handling considering the tire constitutive material as design variables. The importance of this issue is significant from several perspectives such as reducing environmental pollution caused by tire consumption, increasing economic efficiency in the field of supply of tire raw materials, keeping the occupants safe while driving and some improvement in car fuel consumption. Achieving such important goals requires accurate models to compute forces and torques on the tire, as well as interactions. In this research, first the finite element tire model was created in the commercial software Abaqus. Then, using this finite element model, the coefficients of the Fiala model as a mathematical model of the tire were extracted. Next, the complete model of the car was created in the Adams software and the tire coefficients of the Fiala model obtained in the previous section was used in this complete model. To perform the dynamic test of the vehicle, Step Steer manoeuvre according to ISO 7401 standard was used. Finally, from the combination of Abaqus model and Adams model

Biography

Mahsa Rahimbeigi was graduated in bachelor of Automotive Engineering in 2017 and later in master of Applied Mechanical Engineering in 2021 from The Iran University of science and technology. She started her career in 2017 as an industrial engineer in Bon Ghete Company up to 2019.

Recent Publication:

- Wong, J.Y., Theory of ground vehicles. 2008: John Wiley & Sons.
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