

## NUMERICAL MODEL FOR THE STUDY OF THE VEHICLE FRONTAL COLLISION

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### Abstract

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The present paper presents a mathematical model that may be used to study the kinematics of the vehicle before and after the collision and the structure behave during the impact. The algorithm is based on solving some differential equations using Runge-Kutta numerical method. The application range is from 1 dimensional model to planar models and the results obtained for these cases are presented. A full scale numerical model is solved using LS-Dyna to extract input data – like the wall (barrier) force. The models developed will take into account the friction between the structure and the wall as well as the friction between the wheels and the ground.

### Keywords

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Numerical and analytical model, frontal impact, LS-Dyna, Runge-Kutta