BMA4723 VEHICLE DYNAMICS

Assignment 3

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Chapter Description

- Aims
  - To evaluate the basic knowledge of the force distribution at the tire.
- Expected Outcomes
  - Students are able to derive the equations of motion at the longitudinal and lateral axes
- References
  - M.Abe, Vehicle Handling Dynamics Theory and Application, Second Edition, Published by Elsevier Ltd, 2015
  - Thomas D.Gillespie, Fundamental of Vehicle Dynamics, Published by Society of Automotive Engineers

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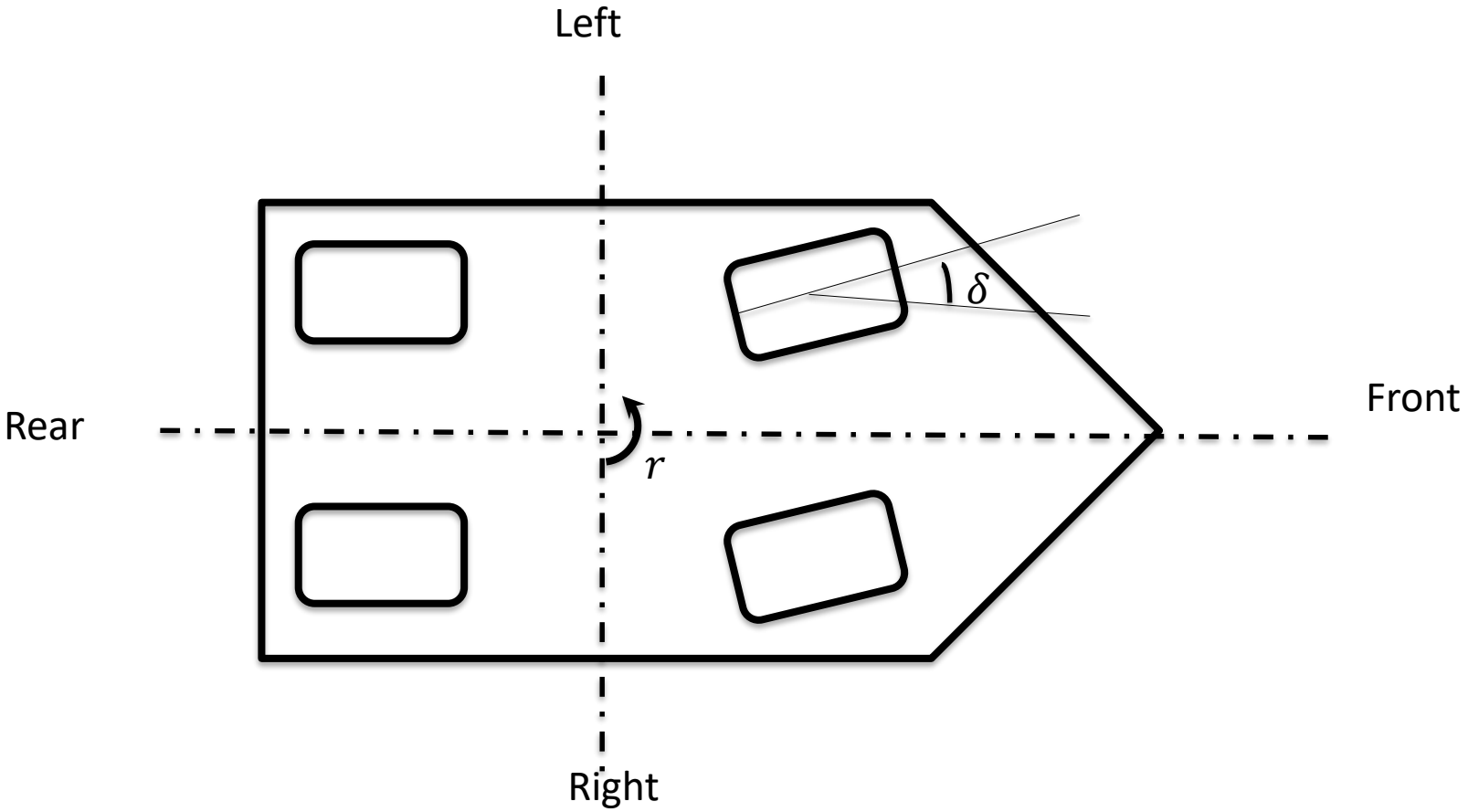

Fig.1 Vehicle model during cornering.

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Fig.1 shows the vehicle model during cornering.
Assume that the steering angle at the front left and right tires are same, determine the longitudinal and lateral equation of motion.

The longitudinal forces: ${}^{x}F_{fr}, {}^{x}F_{fl}, {}^{x}F_{rr}, {}^{x}F_{rl}$
The lateral forces: ${}^{y}F_{fr}, {}^{y}F_{fl}, {}^{y}F_{rr}, {}^{y}F_{rl}$
Mass of the vehicle: m

Vehicle Dynamics

Chapter 4

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