

## Analysis of Motorcycle Slalom Manoeuvres Using the Mozzi Axis Concept

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### SUMMARY

The motion of a rigid body is represented in every instant by rotation about, and translation along, an instantaneous screw axis known as the Mozzi axis. In this paper, the Mozzi axis concept is used to study the kinematics and handling properties of tilting vehicles. Slalom tests performed on the road with three vehicles (a super sport motorcycle, a touring motorcycle and a three-wheeled tilting vehicle) are analyzed, the angle of the Mozzi axis with the road plane and the trace of the Mozzi axis on the road plane are calculated. The influences of cone spacing and forward speed on these parameters are discussed. The geometric loci, which are described by the Mozzi trace and turn center when a tilting vehicle moves along a trajectory, are drawn and compared. The results show that the proposed method of analysis based on the Mozzi axis concept is effective in highlighting the features of slalom manoeuvres and can also be used to study other important manoeuvres.

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