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The chatter of racing motorcycles

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The chatter of motorcycles appears during braking and consists of a vibration of the rear and front unsprung masses at a frequency in the range of 17–22 Hz depending on the motorcycle. This vibration could be very strong and acceleration of the unsprung masses can reach 5–10 g. The chatter is an auto-excited vibration and this fact explains why it appears suddenly when the mechanism of auto-excitation is generated. This paper presents the chatter phenomenon both from an experimental and a numerical point of view. First, the chatter is defined on the basis of some experimental data from racing motorcycles and from the comments of some racing teams technicians. Then, chatter is analysed in different motion conditions and for different braking styles by means of linear and non-linear simulations of the motorcycle dynamics. A physical interpretation of the phenomenon is also proposed.

Keywords: Motorcycle; Chatter; Experiments; Vibration; Multibody

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