

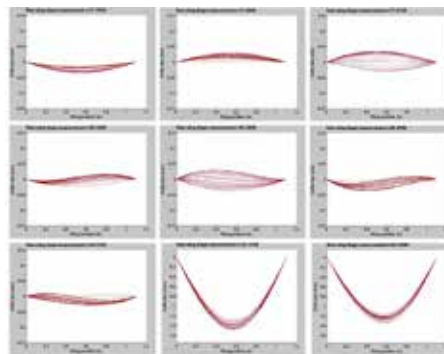


DOWNFORCE AND VIBRATION MEASUREMENTS IN RACE CARS

We demonstrated the measurement capabilities of the Gator for racecar applications by monitoring the downforce of the rear wing of a racecar. Currently only FEM analysis is used to indicate the value of downforce, no actual reference measurements have been performed before to our knowledge.

A single string of fiber with 8 FBGs was embedded on top of the rear wing and then shielded with laminate foil. 2 FBG sensors were embedded without adhesive with the aim for temperature monitoring.

Using the shape reconstruction algorithm different vibration modes along the length dimension of the rear-wing can be visualized. Each plot is a snapshot of a 24 msec period, during the test sequence. With a high wind-velocity a rear wing deflection is measured and in a test bench the deflection has been related to a downforce. The measurements with FBG sensors and our standard **Gator** provided data at 5 kHz (can go up to 19.2 kHz) and provided new insights in the vibration modes and downforce behaviour of the rear wing of a racecar.



Gator

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