

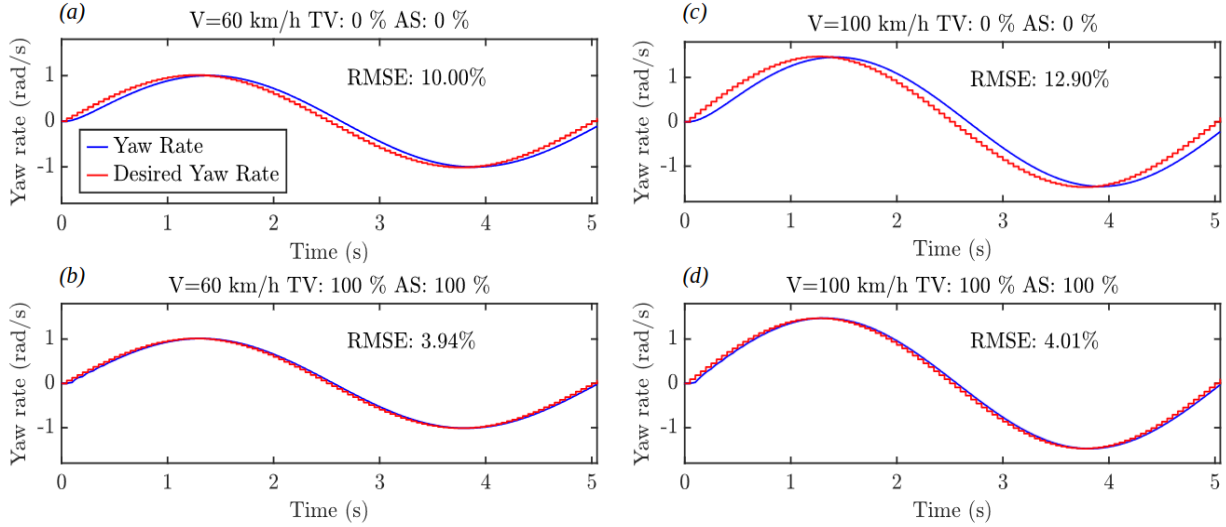
## Fuzzy-based Vehicle Yaw Stability Control System with Torque Vectoring and Active Steering

A standard sinusoidal steering maneuver was performed as per **ISO 7401:2011** specification, where a sinusoidal steering input of amplitude 10 degrees is given at 0.2 Hz for two vehicle speeds: 100 km/h and 60 km/h.

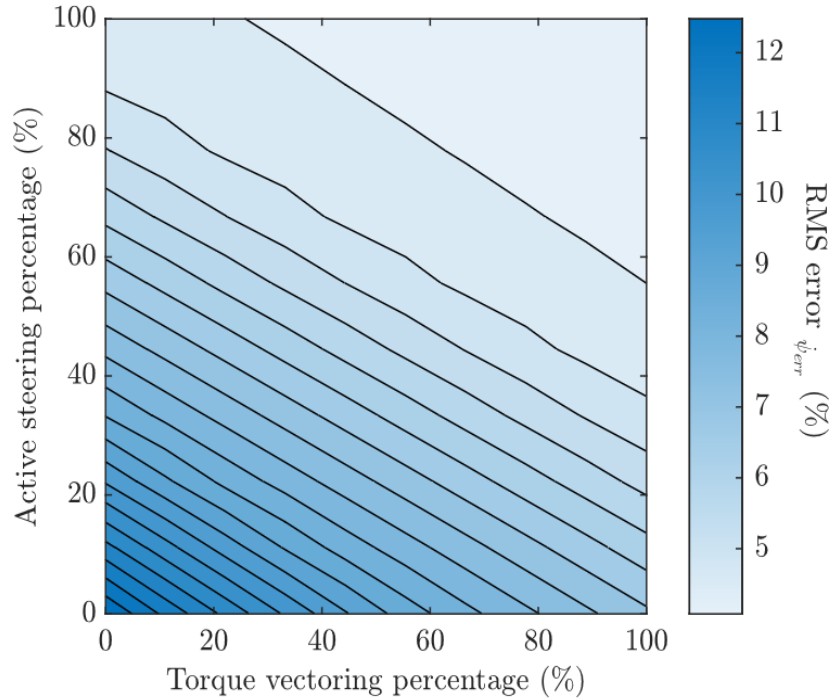
To quantify the yaw rate error, the Root Mean Square Error (RMSE %) is calculated:

$$\text{RMSE}_{\dot{\psi}_{err}} (\%) = \sqrt{\frac{1}{N} \sum_{i=1}^N \left( \frac{\dot{\psi}_{des} - \dot{\psi}}{\hat{\dot{\psi}}_{max}} \right)^2} \times 100\%$$

## Results



Actual yaw rates (blue) and desired yaw rates (red) against time at different Active Steering (AS) and Torque Vectoring (TV) percentages for 60 km/h and 100 km/h



Contour map of normalised root mean square (RMS) error percentage % of the yaw rate ( $\gamma$ ) for different torque vectoring percentages (%) and active steering percentages (%) for the velocity  $V = 100$  km/h