

Information about research data for the thesis:

Aerodynamics and Experimental Optimisation of Automotive Underbody Diffusers in the Presence of Rake

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Included in this archive is the complete database of aerodynamic measurements obtained using the large-scale experimental system in a wind tunnel with a moving ground. Some of this data was presented and discussed in Chapter 6 and Appendix A of the thesis, but the entire database is published for the benefit of the research community. Importantly, any citation of this data should be clearly attributed to the author of the thesis, in accordance with the copyright statement included in the thesis.

There are 9 data files in the CSV format in the archive, corresponding to the three configurations of the diffuser model:

- **with_end_plates** — full sidewalls, with end plates along the entire underfloor, and an open tail cavity
- **no_end_plates** — sliding sidewalls, with no end plates along the underfloor, and an open tail cavity
- **closed_cavity** — full sidewalls, with end plates along the entire underfloor, and the tail cavity closed using the thin-film system

and the three types of sweeps carried out:

- **ride_height_sweeps** — sweeps of ride height at constant rake and diffuser angles
- **rake_sweeps** — sweeps of rake angle at constant ride height and diffuser angle
- **diffuser_sweeps** — sweeps of diffuser angle at constant ride height and rake angle

Each row in the data files corresponds to one data point, and the columns are as follows:

- Column 1: **sweep_ID** — unique identifier of the sweep
- Column 2: **data_point_ID** — unique identifier of the data point
- Column 3: **ride_height_(h₁/H)** — non-dimensional ride height h_1/H
- Column 4: **rake_angle_(deg)** — rake angle in degrees
- Column 5: **diffuser_angle_(deg)** — diffuser angle in degrees
- Columns 6 to 11: **C_x_(CD), C_y, C_z_(CL), C_{mx}, C_{my}, C_{mz}** — force and moment coefficients of the diffuser model
- Columns 12 to 137: **C_p_#** — surface pressure coefficients at corresponding pressure tap numbers

Furthermore, the file `Diffuser_data_(pressure_tap_coordinates).csv` contains a list of coordinates x/L_M and y/W of each pressure tap number #. As in the thesis, these coordinates are for undeflected underfloor and diffuser plates.