1. **hRideF:** Front ride height;
2. **hRideR:** Rear ride height;
3. **aSteerAbs:** Absolute value of the average angle of the steered wheels;
4. **aRollAbs:** Absolute value of the roll angle of the car, relative to the track;
5. **cFlowCurvature:** Curvature of the air flow over the car;
6. **aYaw &/or aYawAbs:** Yaw angle of the air flow over the car, measured at the car centre-of-gravity;
7. **aYawF &/or aYawFAbs:** Yaw angle of the air flow over the car, measured at the front ride-height measurement point;
8. **aYawR &/or aYawRAbs:** Yaw angle of the air flow over the car, measured at the rear ride-height measurement point;
9. **aYawSignedByaSteer:** -aYaw * sign(aSteerWheel);
10. **aYawFSignedByaSteer:** -aYawF * sign(aSteerWheel), results in negative front air yaw angle in low speed;
11. **aYawRSignedByaSteer:** -aYawR * sign(aSteerWheel);
12. **aFlapF:** Front wing flap angle;
13. **aFlapR:** Rear wing flap angle;
14. **Const:** A constant term.
15. **rExhaustMomentumRatio** Ratio between exhaust momentum and free-stream momentum. FExhaustThrust table needs to be populated in the powertrain section.

$$rExhaustMomentumRatio = \frac{FExhaustThrust}{\frac{1}{2}\rho v_{\mathrm{Air}}^2 A_{\mathrm{ref}}}$$

Should users wish to use other *aerodynamic degrees of freedom* these can be added to the model with great ease, please contact us to discuss your requirements.

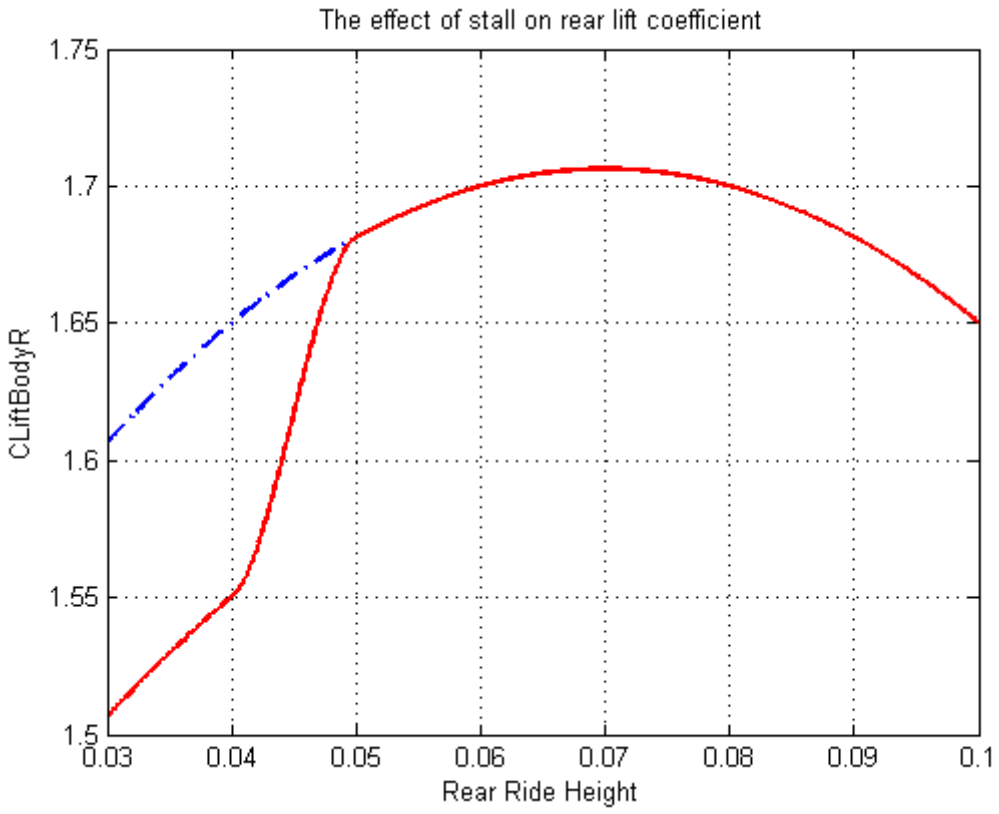
Offset Map

To make it convenient for users to save different aerodynamic components (for example: wings, gurneys etc...), these can be entered into any of the five Primary Offset Maps. The parameterisation of an offset map is similar to the base polynomial map, and is made up of *PolynomialTerms* and *PolynomialCoefficients* however, the coefficients are offsets which get added to the relevant coefficient in the base map. Useful tips for working with offset maps are:

- The polynomical terms used in the offset map can be different to the base map; we can introduce additional terms or define fewer terms as desired, and input these in any order.
- It may be useful to save individual offset maps, in effect building up a list of aerodynamic components which the user can later select and load into the car.

Stall Behaviour

Stall is a significant non-linearity not easily captured by other parts of the aerodynamic model. The quasi-static simulations provided by Canopy model stall as a rapid loss of front lift, rear lift and drag between a rear ride height at which stall initiates, and a second rear ride height at which stall is complete. This is illustrated in the figure below. The user can specify the rear ride heights at which stall starts and becomes complete, along with the effect of that stall on the front and rear lift coefficients and the drag coefficient.



Drag Reduction System

The effect of DRS deployment can be expressed as offsets with the following parameters:

Parameter	Definition
CLiftBodyFOffset	Offset in front lift coefficient under DRS deployment.