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AXLE SPEED CONTROL FOR VEHICLE DRIFTS

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AXLE SPEED CONTROL FOR VEHICLE DRIFTS

Initial situation:

In BEVs with two "independent" (mechanically uncoupled) drive axles, wheel slippage is "caught" on the two axles by anti-slip control (ASR).

The distribution of power between the axles is controlled by torque using the current software.

Disadvantage:

The wheel speed is not included in the control. When anti-slip control is deactivated, the front axle, for example, can have a multiple of the wheel slip of the rear axle when accelerating. The front axle would therefore turn much faster than the rear axle. If the vehicle is drifting, the front wheels, for example, wear out much faster than the rear wheels. And the drift behaviour can thus be unintentionally influenced

Solution:

For vehicles where the two drive axles can be speed-controlled separately, it should be possible to control a speed difference between the two axles. If both axles are in slip, a differential speed control between the axles should control the slip, e.g. of the front axle, depending on the rear axle speed. (or vice versa)

Advantages:

- The drift behaviour of the vehicle can be positively influenced (controlled).
- The front wheels do not wear as quickly, for example.

Technical implementation:

Drive software function:

The axles are driven via a (usual) fixed torque distribution when the wheels are not slipping.

As soon as an axle starts to slip (activation/deactivation by means of hysteresis), the front axle, for example, is speed-controlled depending on the rear axle speed.

- This means that there is then no longer any torque distribution between the axles,
- but e.g. the rear axle is torque-controlled depending on the position of the accelerator pedal.
- The front axle is then speed-controlled, depending on the speed of the rear axle.
- The front axle can then rotate at the same speed, faster or slower than the rear axle. (Slower only if the rear axle is also slipping).

Instead of the wheel speed, the wheel speed can also be used for the control.