### Parameter block & Constant

## Calculation block

### Inputs & Outputs

#### ***Input***

Sideslip angle at front axle:

#### ***Input***

Lateral force:

Cos

Sin

Cornering Stiffnesss

Sin

Total longitudinal force on the :

* ***Annotations****:*

*Vehicle speed (km/h)*

*Vehicle mass (kg)*

*Steer angle (rad)*

*distance from the center gravity to front and rear axle respectively (m)*

*Sideslip anngle at vehicle center gravity (rad)*

*Yaw rate (rad/s)*

*: Cornering Stiffness (N/rad)*

*: Camber Stiffness (N/rad)*

*Gravitional acceleration ( /)*

*: Rolling resistance coefficient*

*Longitudinal friction coefficient*

*Kingpin angle (rad)*

*Caster angle (rad)*

*Camber angle (rad)*

*Scrub radius (m)*

*Wheel base (m)*

&

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Normal force:

Rolling resistance force:

Cos

Longitudial force:

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#### ***Output***

The total resistance caused by longitudinal forces :

The moment arm:

Cos

Sideslip angle at front axle:

### Parameter block & Constant

## Calculation block

### Inputs & Outputs

#### ***Input***

cos

cos

Lateral force:

sin

Longitudial   
force:

#### ***Input***

Total lateral force on the :

The total resistance caused by lateral forces :

The moment arm:

cos

sin

Cornering Stiffnesss

Rolling resistance force:

.

Normal force:

&

* ***Annotations****:*

*Vehicle speed (km/h)*

*Vehicle mass (kg)*

*Steer angle (rad)*

*distance from the center gravity to front and rear axle respectively (m)*

*Sideslip angle at vehicle center gravity (rad)*

*Yaw rate (rad/s)*

*: Cornering Stiffness (N/rad)*

*: Camber Stiffness (N/rad)*

*Gravitional acceleration ( /)*

*: Rolling resistance coefficient*

*Longitudinal friction coefficient*

*Kingpin angle (rad)*

*Caster angle (rad)*

*Camber angle (rad)*

*Tire radius (m)*

*Total trail (m)*

*Wheel base (m)*

#### ***Output***

* ***Annotations****:*

*Vehicle mass (kg)*

*Steer angle (rad)*

*distance from the center gravity to rear axle(m)*

*Gravitional acceleration ( /)*

*Kingpin angle (rad)*

*Caster angle (rad)*

*Tire radius (m)*

*Wheel base (m)*

The total resistance torque caused by normal forces :

#### ***Output***

tan

The moment arm:

The total normal force:

Normal force:

#### ***Input***

### Parameter block & Constant

## Calculation block

### Inputs & Outputs