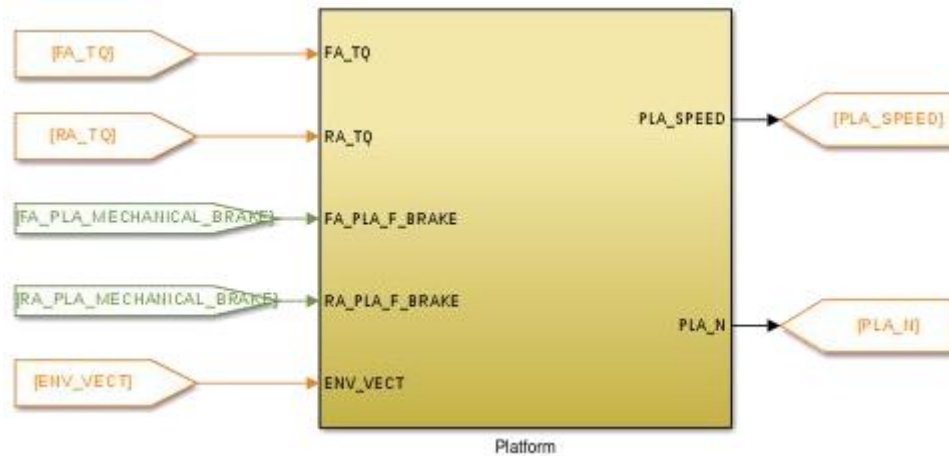


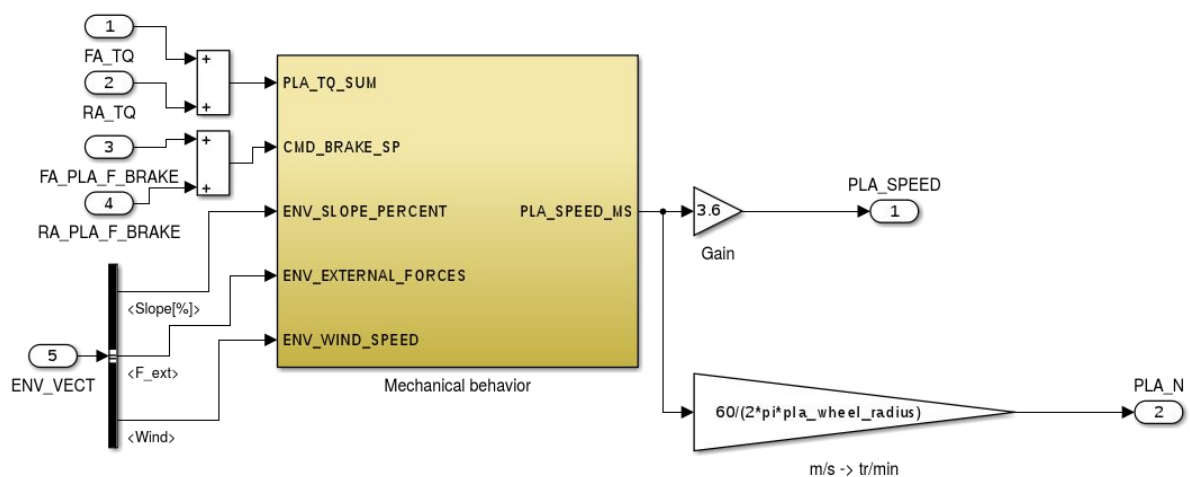
# Platform model

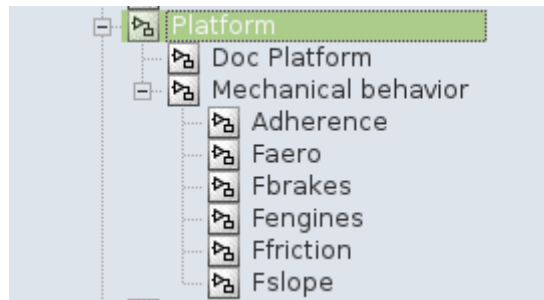
## 1 System description

Model of the platform. Based on the mechanic equation, this model calculates the speed of the car and the braking.



## 2 System organization





Model browser

## 3 Signals and parameters

### Inputs

Name	Description	Note
FA_TQ	Torque to wheel from the front axle	
RA_TQ	Torque to wheel from the rear axle	
FA_PLA_F_BRAKE	Force set point of mechanical brake of front axle	In N
RA_PLA_F_BRAKE	Force set point of mechanical brake of front axle	In N
ENV_VECTOR	Environment data, includes: <ul style="list-style-type: none"> <li>- Slope (%)</li> <li>- External forces (N)</li> <li>- Wind speed (m/s)</li> </ul>	Bus signal

### Outputs

Name	Description	Note	Destination
PLA_SPEED	Car speed	In km/h	Driver
PLA_N	Wheel speed	In RPM	Command, front axle, rear axle

### Parameters

#### Native

Name	Type	Unit	Description	Source	Linked to
pla_csat	Var	-	Static friction coefficient	Continental	
pla_equivalent_weight	var	kg	Car equivalent weight	BEI N7 2014	
pla_f	var	-	Friction coefficient	Continental	
pla_initial_speed	var	m/s	Initial speed	Case specific	
pla_k	var	-	Friction coefficient	Continental	
pla_kaero	var	-	Cx of the car	Continental	
pla_max_f_brakes	var	N	Maximum brakes force	Continental	
pla_wheel_radius	var	m	Wheel radius (includes tire deformation)	BEI N7 2014	

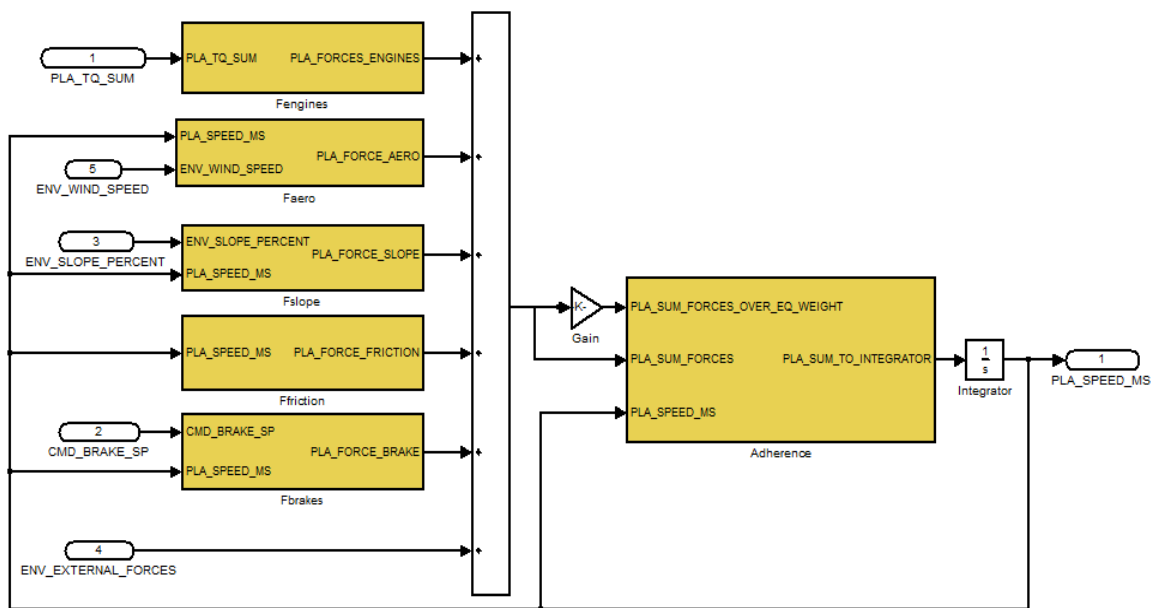
## Inherited

None

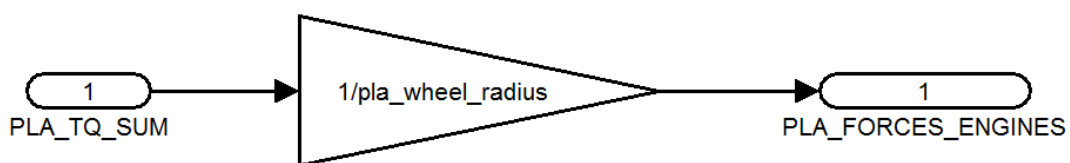
## 4 Subsystems description

### Mechanical behavior:

Based on Newton's second law to calculate the car speed. Each force is in a separate subsystem.  
Based on the BEI N7 2014 model, only the friction and adherence have been modified.

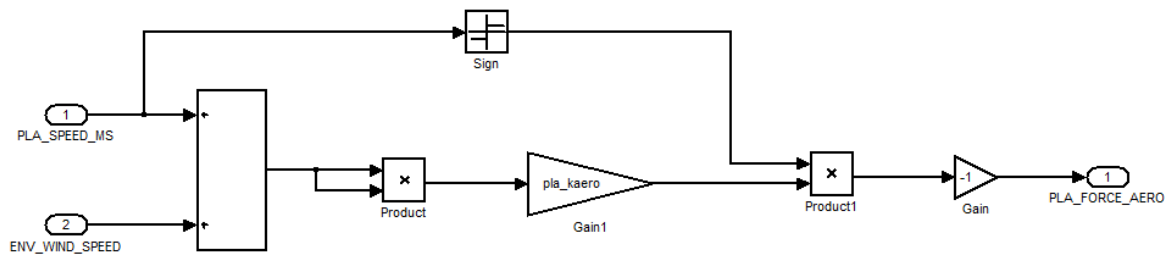


### Fengines:



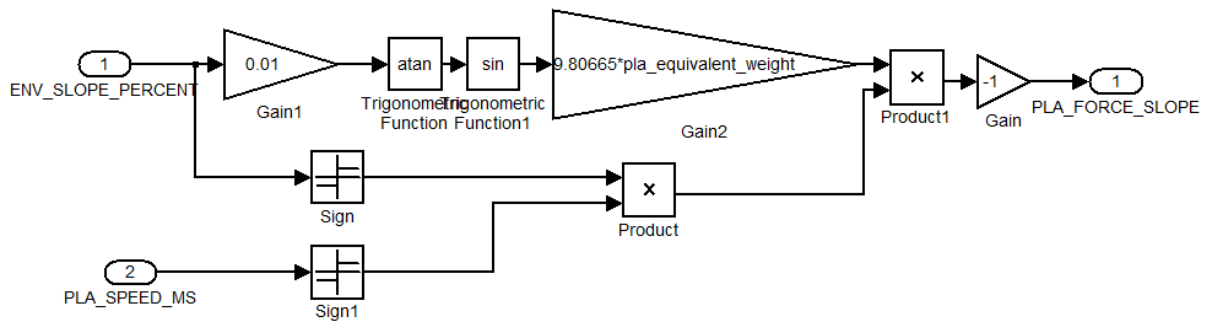
### Faero

Aerodynamic resistance.



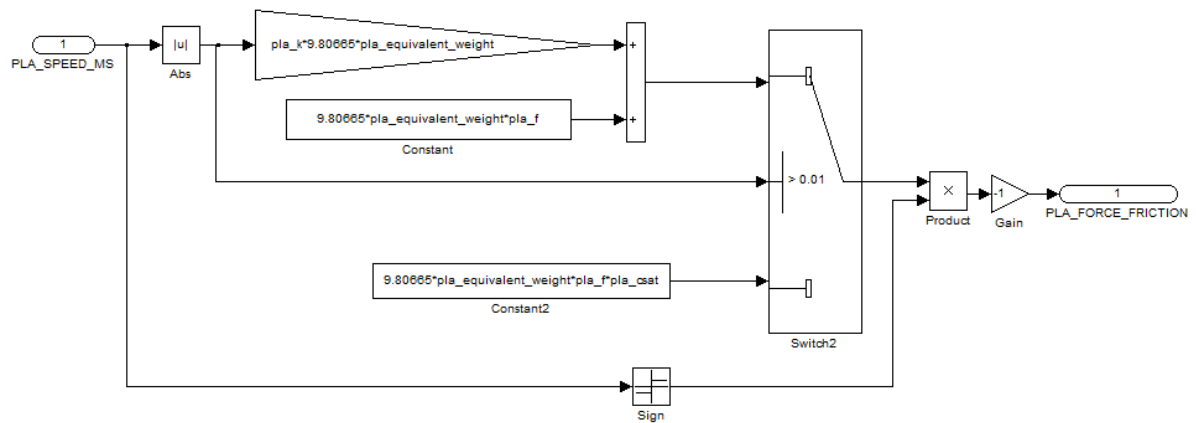
## Fslope

Effect of a slope.



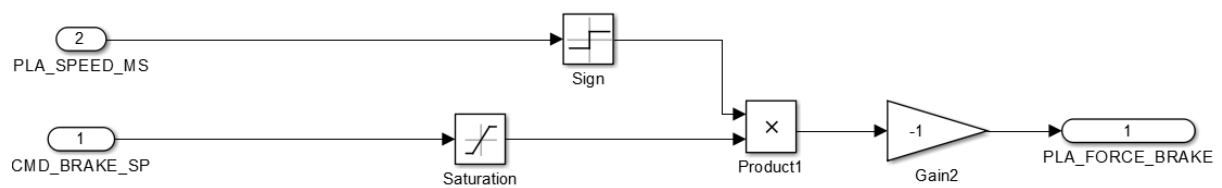
## Ffriction

Friction forces.



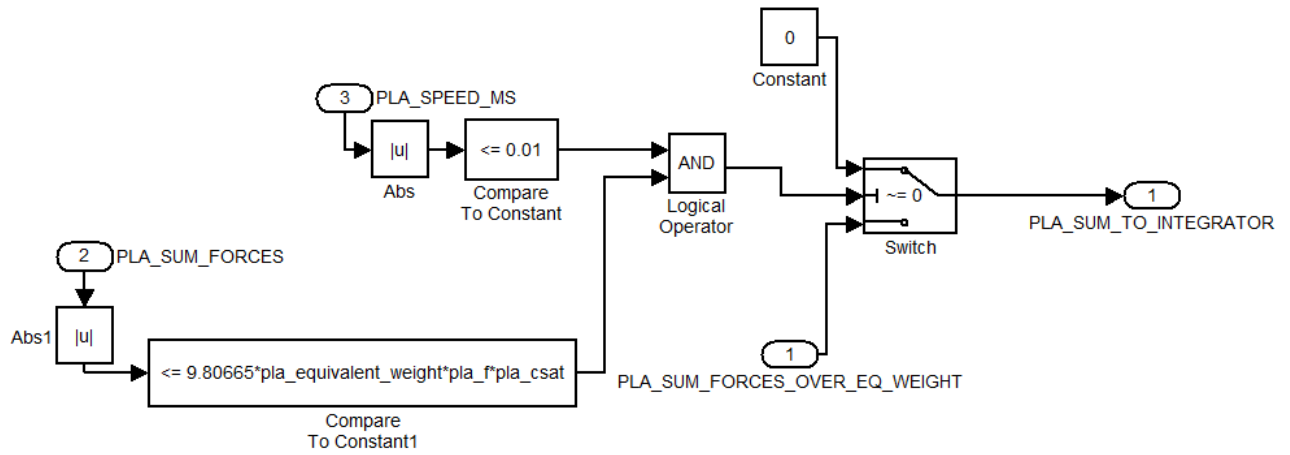
## Fbrakes

Brakes system.

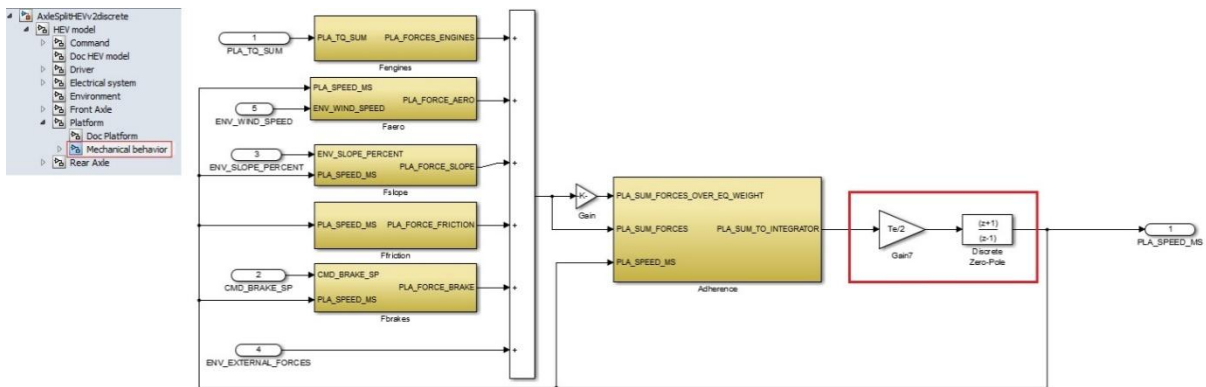


## Adherence

Adherence of the car, preventing from moving.



## 5 Discrete model



Same inputs, outputs and parameters. The only changes are in the red square.

See part 5 ("Discrete model") of the document "HEV model" to know how are made the discrete blocs.