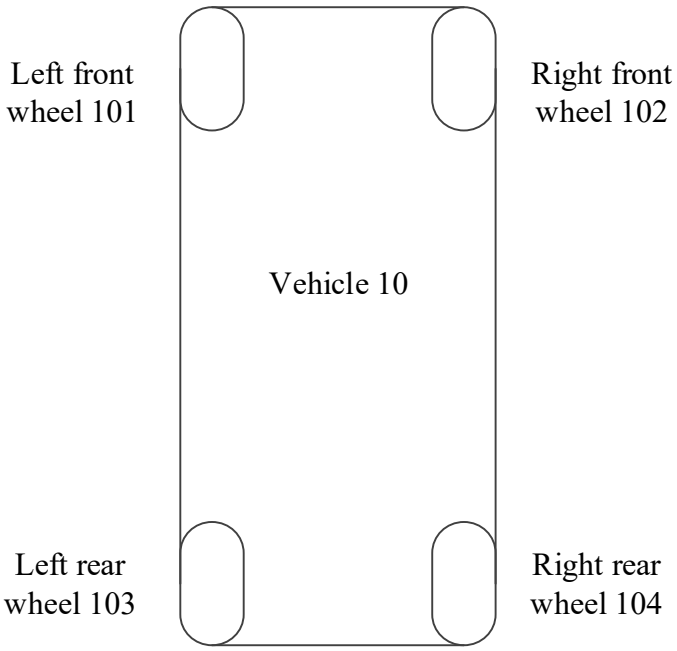

Left front wheel 101
Right front wheel 102
Vehicle 10
Left rear wheel 103
Right rear wheel 104

FIG. 1

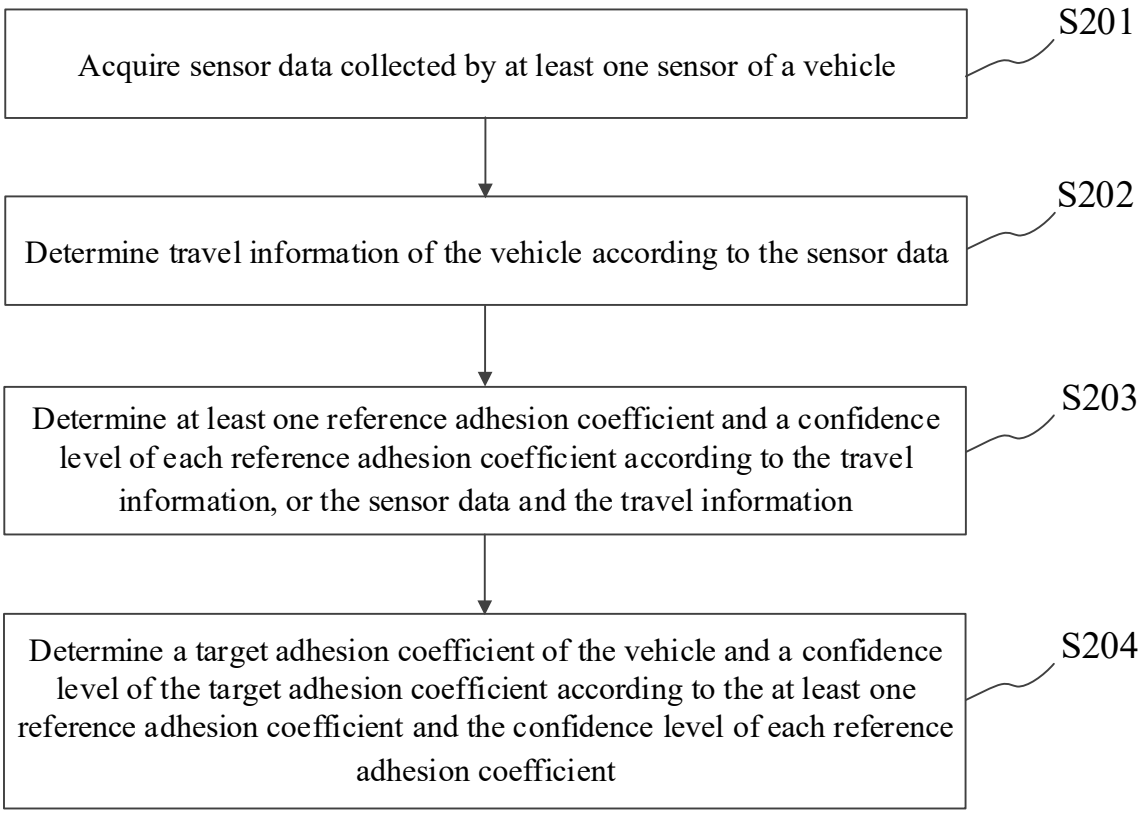

Acquire sensor data collected by at least one sensor of a vehicle
S201
Determine travel information of the vehicle according to the sensor data
S202
Determine at least one reference adhesion coefficient and a confidence level of each reference adhesion coefficient according to the travel information, or the sensor data and the travel information
S203
Determine a target adhesion coefficient of the vehicle and a confidence level of the target adhesion coefficient according to the at least one reference adhesion coefficient and the confidence level of each reference adhesion coefficient
S204

FIG. 2a

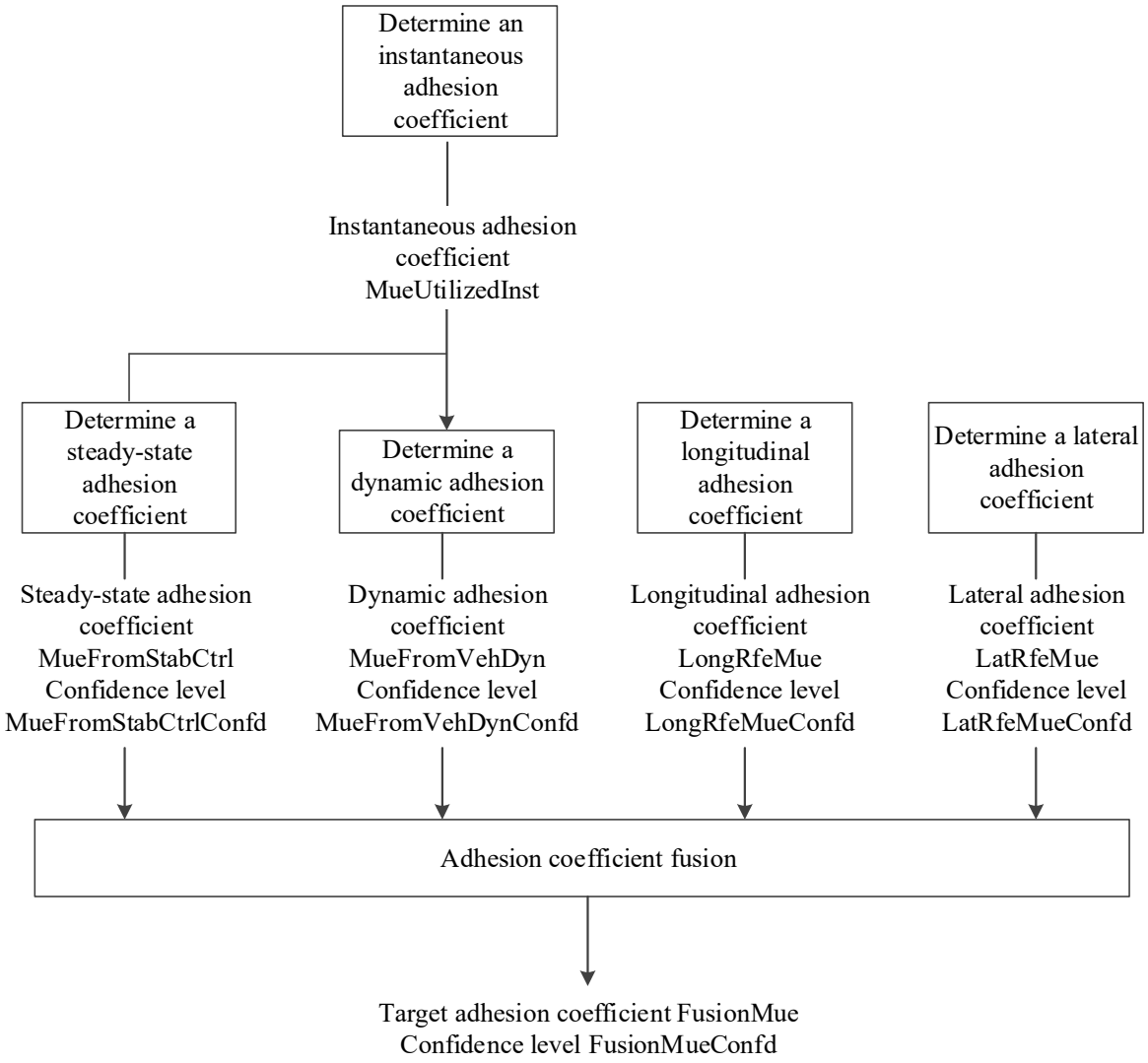

Determine an instantaneous adhesion coefficient
Instantaneous adhesion coefficient MueUtilizedInst
Determine a steady-state adhesion coefficient
Determine a dynamic adhesion coefficient
Determine a longitudinal adhesion coefficient
Determine a lateral adhesion coefficient
Steady-state adhesion coefficient MueFromStabCtrl Confidence level MueFromStabCtrlConfd
Dynamic adhesion coefficient MueFromVehDyn Confidence level MueFromVehDynConfd
Longitudinal adhesion coefficient LongRfeMue Confidence level LongRfeMueConfd
Lateral adhesion coefficient LatRfeMue Confidence level LatRfeMueConfd
Adhesion coefficient fusion
Target adhesion coefficient FusionMue Confidence level FusionMueConfd

FIG. 2b

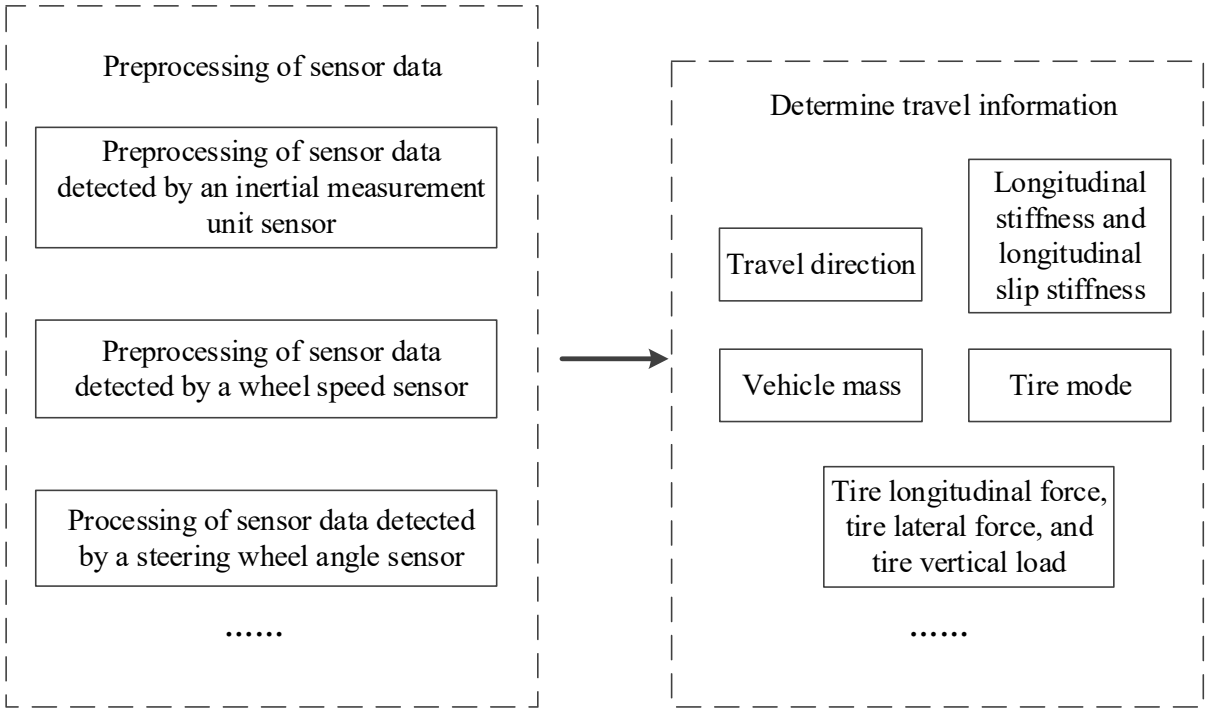

Preprocessing of sensor data
Preprocessing of sensor data detected by an inertial measurement unit sensor
Preprocessing of sensor data detected by a wheel speed sensor
Processing of sensor data detected by a steering wheel angle sensor
.....
Determine travel information
Travel direction
Longitudinal stiffness and longitudinal slip stiffness
Vehicle mass
Tire mode
Tire longitudinal force, tire lateral force, and tire vertical load
.....

FIG. 2c

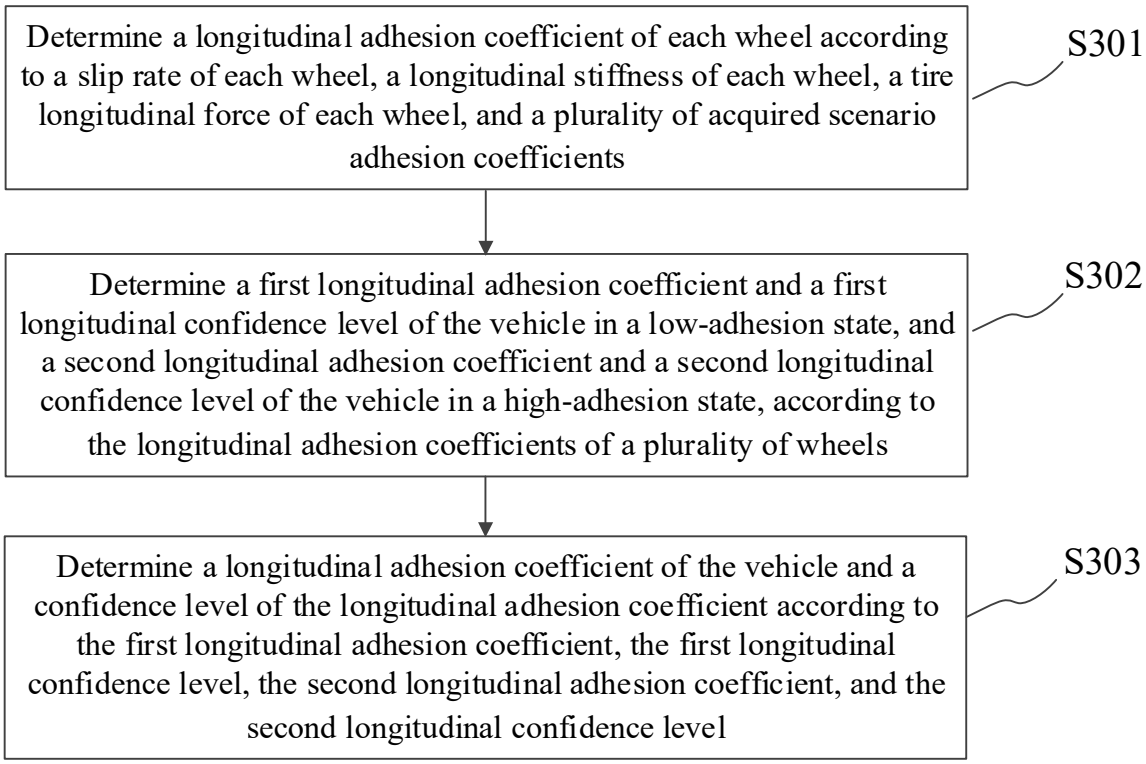

Determine a longitudinal adhesion coefficient of each wheel according to a slip rate of each wheel, a longitudinal stiffness of each wheel, a tire longitudinal force of each wheel, and a plurality of acquired scenario adhesion coefficients
S301
Determine a first longitudinal adhesion coefficient and a first longitudinal confidence level of the vehicle in a low-adhesion state, and a second longitudinal adhesion coefficient and a second longitudinal confidence level of the vehicle in a high-adhesion state, according to the longitudinal adhesion coefficients of a plurality of wheels
S302
Determine a longitudinal adhesion coefficient of the vehicle and a confidence level of the longitudinal adhesion coefficient according to the first longitudinal adhesion coefficient, the first longitudinal confidence level, the second longitudinal adhesion coefficient, and the second longitudinal confidence level
S303

FIG. 3

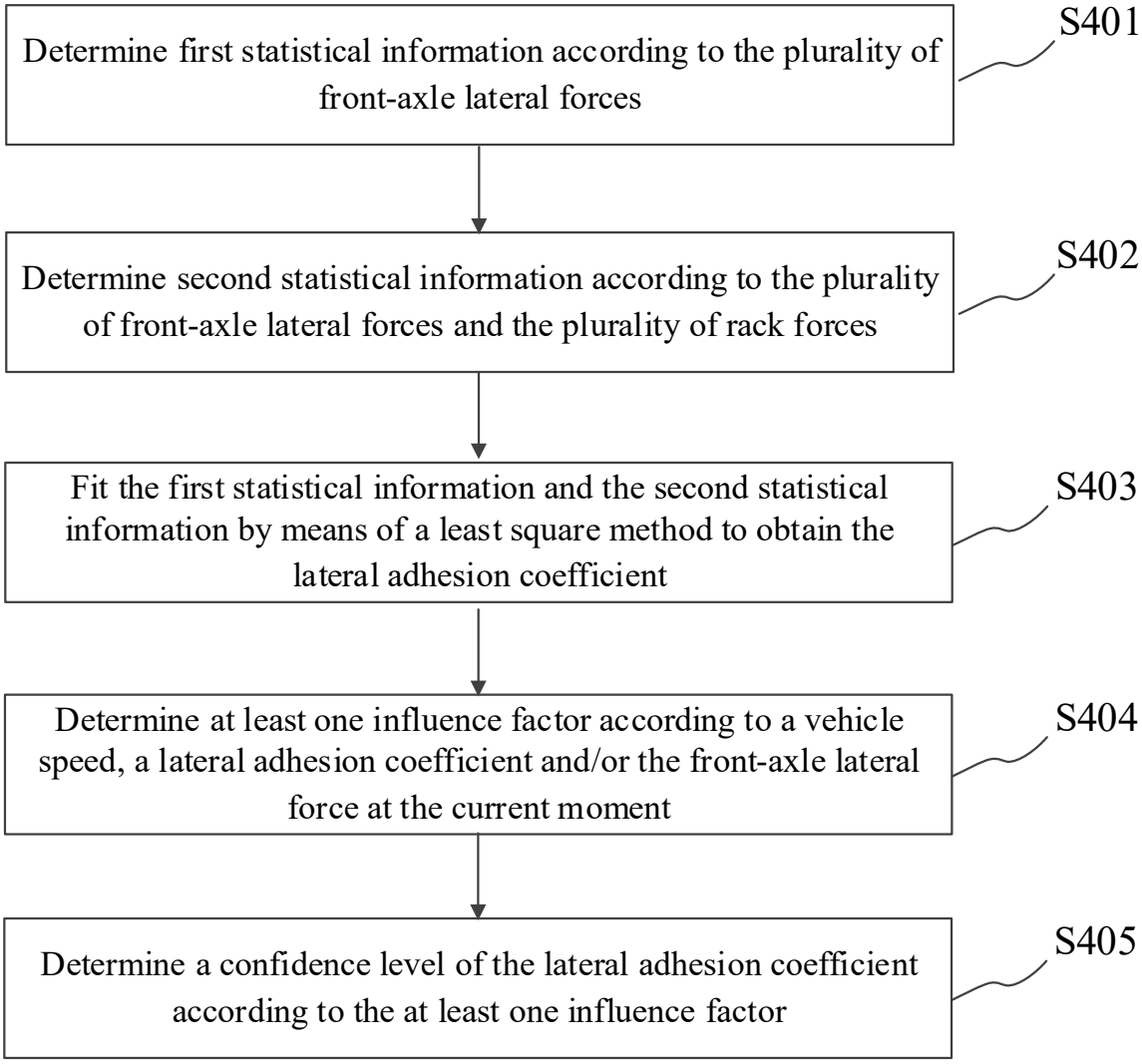

Determine first statistical information according to the plurality of front-axle lateral forces
S401
Determine second statistical information according to the plurality of front-axle lateral forces and the plurality of rack forces
S402
Fit the first statistical information and the second statistical information by means of a least square method to obtain the lateral adhesion coefficient
S403
Determine at least one influence factor according to a vehicle speed, a lateral adhesion coefficient and/or the front-axle lateral force at the current moment
S404
Determine a confidence level of the lateral adhesion coefficient according to the at least one influence factor
S405

FIG. 4

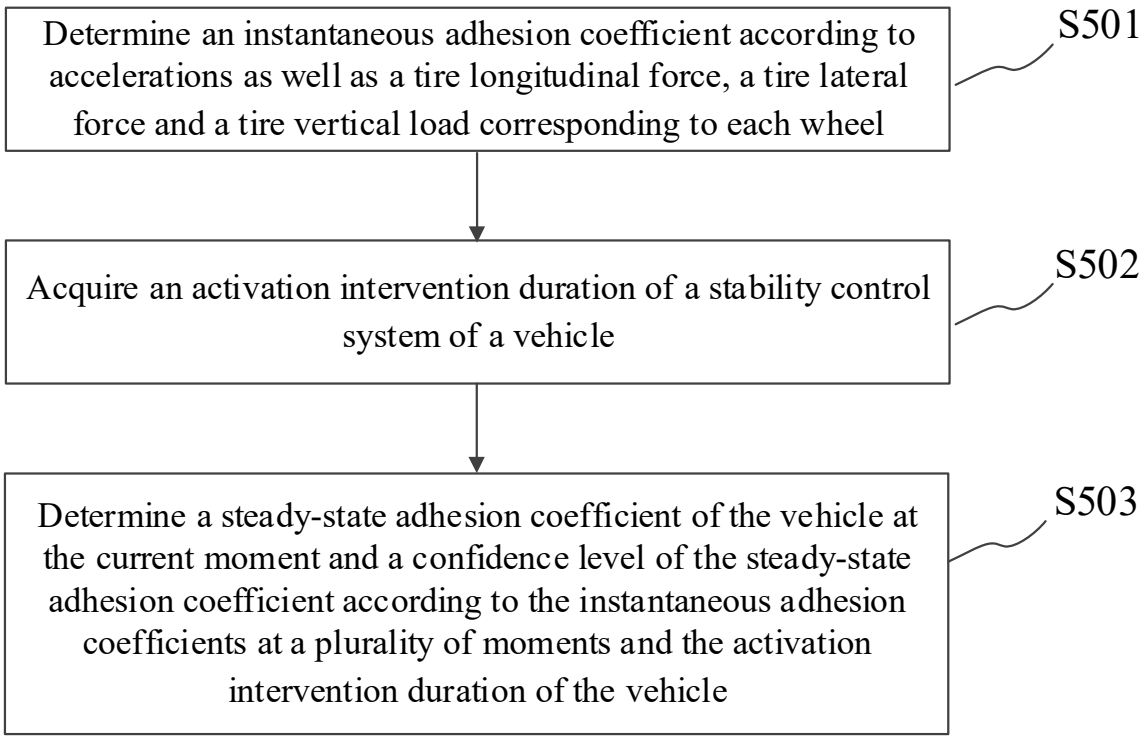

Determine an instantaneous adhesion coefficient according to accelerations as well as a tire longitudinal force, a tire lateral force and a tire vertical load corresponding to each wheel
S501
Acquire an activation intervention duration of a stability control system of a vehicle
S502
Determine a steady-state adhesion coefficient of the vehicle at the current moment and a confidence level of the steady-state adhesion coefficient according to the instantaneous adhesion coefficients at a plurality of moments and the activation intervention duration of the vehicle
S503

FIG. 5

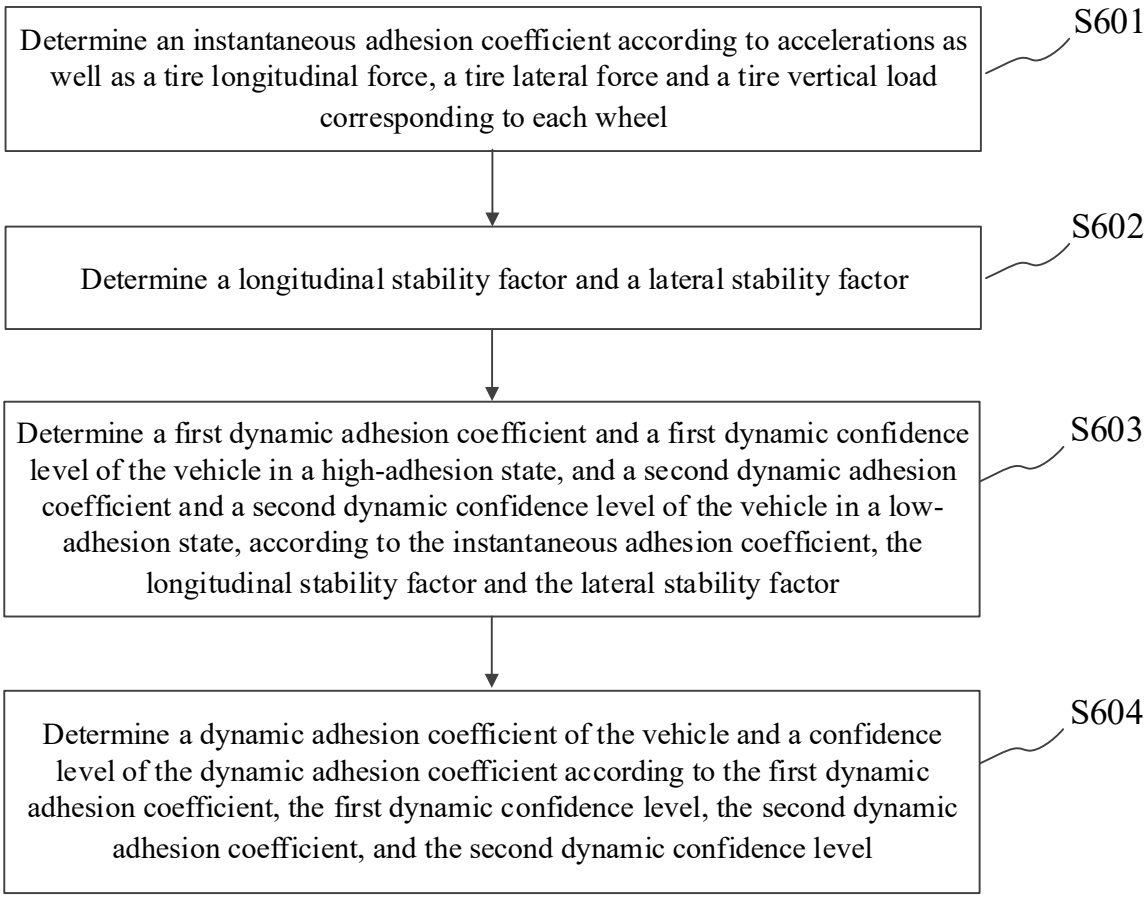

Determine an instantaneous adhesion coefficient according to accelerations as well as a tire longitudinal force, a tire lateral force and a tire vertical load corresponding to each wheel
S601
Determine a longitudinal stability factor and a lateral stability factor
S602
Determine a first dynamic adhesion coefficient and a first dynamic confidence level of the vehicle in a high-adhesion state, and a second dynamic adhesion coefficient and a second dynamic confidence level of the vehicle in a low-adhesion state, according to the instantaneous adhesion coefficient, the longitudinal stability factor and the lateral stability factor
S603
Determine a dynamic adhesion coefficient of the vehicle and a confidence level of the dynamic adhesion coefficient according to the first dynamic adhesion coefficient, the first dynamic confidence level, the second dynamic adhesion coefficient, and the second dynamic confidence level
S604

FIG. 6

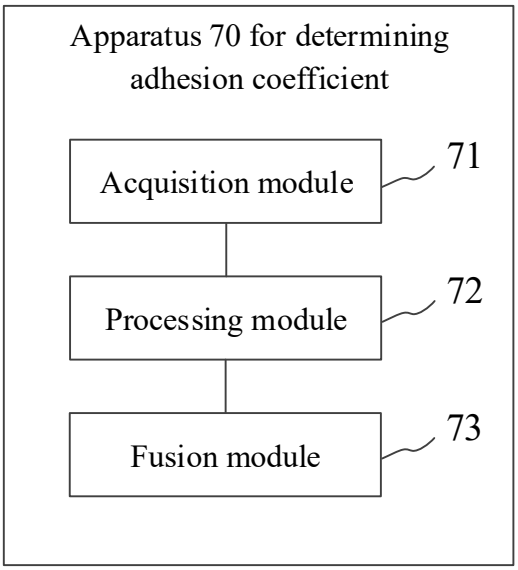

Apparatus 70 for determining adhesion coefficient
Acquisition module
71
Processing module
72
Fusion module
73

FIG. 7

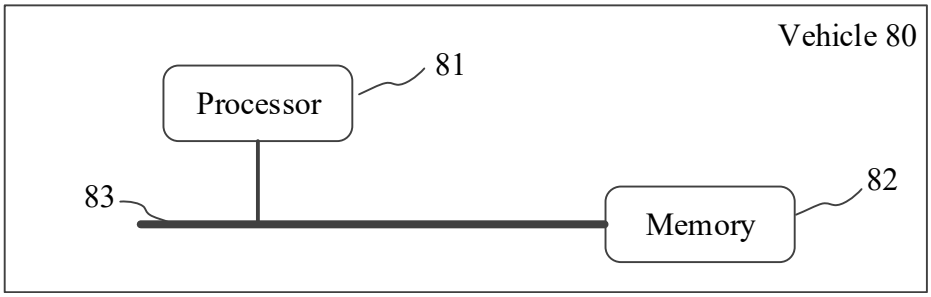

Vehicle 80
Processor
81
83
Memory
82

FIG. 8