二輪車の定常円旋回特性に関する研究 Study on Characteristics of Steady State Turning for Two-wheeled Vehicles

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Specification of the experimental vehicle

Parameter	definition	value
т	Vehicle mass	260 (kg)
l_1	Length between front tire axle and C.G.	0.913 (m)
l_2	Length between rear tire axle and C.G.	0.636 (m)
h_G	Height of C.G.	0.599 (m)
C_{s1}	Front cornering coefficient	11.3 (-)
C_{s2}	Rear cornering coefficient	16 (-)
C_{c1}	Front camber coefficient	1.2 (-)
C_{c2}	Rear camber coefficient	1.5 (-)

Coordinate systems for two wheeled vehicle



Influence of camber thrust in steer characteristics

A term of the camber thrust in the SF is as follows,

$$K_{C} = \frac{K_{c2}K_{s1} - K_{c1}K_{s2}}{gK_{s1}K_{s2}l} = \frac{l_{1}mg\kappa_{2}(K_{s1} - \xi K_{s2})}{gK_{s1}K_{s2}l^{2}} = \frac{l_{1}m\kappa_{2}(K_{s1} - \xi K_{s2})}{K_{s1}K_{s2}l^{2}}$$

In the same way, the side slip characteristics is as follows,

$$K_{\beta_{c}} = \frac{K_{c2}l}{gK_{s2}l_{2}l} = \frac{K_{c20}\frac{K_{c2}}{K_{c20}}l}{gK_{s2}l_{2}l} = \frac{l_{1}mg\kappa_{2}}{gK_{s2}l_{2}l}$$

Influence of camber thrust to the stability factor

Stability factor x 10⁻⁸ K_{δ} -2 -4 -0.5 1.5 $\frac{K_{c10}}{K_{c20}}$ κ_2 50 η 1.5 0.5 $K_{c2} = K_{c20}$

Conclusions

Analyzing the steady state characteristic of a two-wheeled vehicle, the results were obtained as follows,

1. Since the steer characteristic and sideslip characteristics of a two-wheeled vehicle | are described by camber thrust and cornering force, in a linear region, it is separated into two parts, one is described by just cornering forces such as passenger cars, and the other is connected by camber thrust which is original term on two-wheeled vehicles.