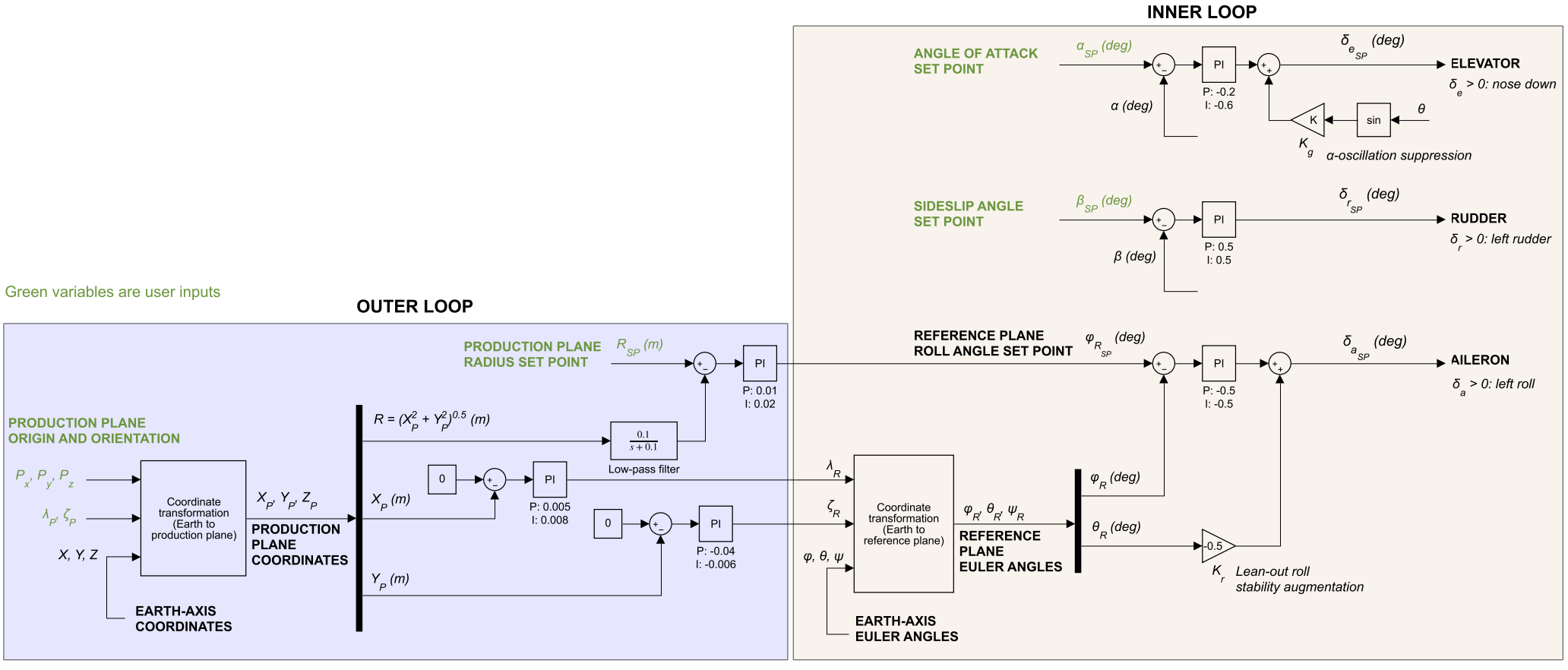
INNER LOOP
ANGLE OF ATTACK SET POINT
α_{SP} (deg)
PI
P: -0.2
I: -0.6
$\delta_{e_{SP}}$ (deg)
ELEVATOR
δ_e > 0: nose down
α (deg)
K
sin
θ
K_g
α-oscillation suppression
SIDESLIP ANGLE SET POINT
β_{SP} (deg)
PI
P: 0.5
I: 0.5
$\delta_{r_{SP}}$ (deg)
RUDDER
δ_r > 0: left rudder
β (deg)
Green variables are user inputs
OUTER LOOP
PRODUCTION PLANE RADIUS SET POINT
R_{SP} (m)
PI
P: 0.01
I: 0.02
REFERENCE PLANE ROLL ANGLE SET POINT
$\varphi_{R_{SP}}$ (deg)
PI
P: -0.5
I: -0.5
$\delta_{a_{SP}}$ (deg)
AILERON
δ_a > 0: left roll
PRODUCTION PLANE ORIGIN AND ORIENTATION
P_x, P_y, P_z
λ_P, ζ_P
X, Y, Z
Coordinate transformation (Earth to production plane)
X_P, Y_P, Z_P
PRODUCTION PLANE COORDINATES
EARTH-AXIS COORDINATES
$R = (X_P^2 + Y_P^2)^{0.5}$ (m)
$\frac{0.1}{s+0.1}$
Low-pass filter
X_P (m)
Y_P (m)
0
PI
P: 0.005
I: 0.008
0
PI
P: -0.04
I: -0.006
λ_R
ζ_R
φ, θ, ψ
Coordinate transformation (Earth to reference plane)
φ_R, θ_R, ψ_R
REFERENCE PLANE EULER ANGLES
EARTH-AXIS EULER ANGLES
φ_R (deg)
θ_R (deg)
-0.5
K_r
Lean-out roll stability augmentation