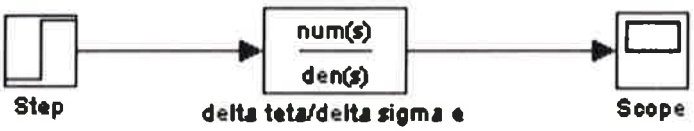
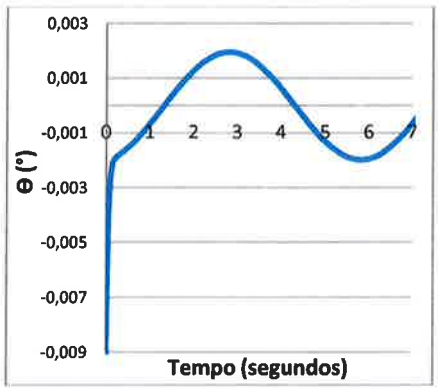
6 - Control report

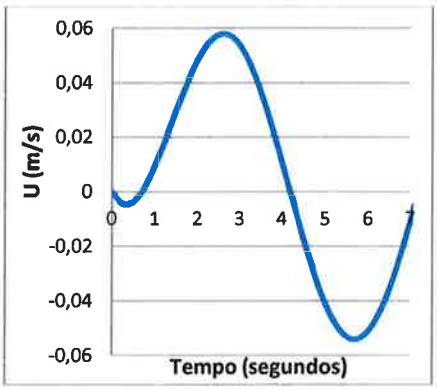
Deflecting the control surfaces,the pilot causes a change in the effective camber of the lifting surface changing its normal force thereby producing a moment and subsequent angular rate about the associate axis of the aircraft.To know better the dynamic responses during a flight, the transfer functions were calculated as seen in [NELSON] to observe how the velocities in the three axis(U,V,W), the roll and pitch angles(Θ,Φ) besides the angular rate in the normal axis(r) vary according to control input assuming it starts in zero.A dynamic simulation made using SIMULINK ambient is exemplified below and analyzing the graphics found we conclude the project limitations in flight as a deflection of 1 degree.

Figure. 6.1.1:



Graph.6.1.1-Maximum |Θ|: .009° Graph.6.1.2-Maximum |W|: .027ft/s Graph.6.1.3-Maximum U: .058ft/s





Graph.6.1.4 - Maximum |V| [lb/s]: Rudder: .00052; Aileron: .0017

Graph.6.1.5 - Maximum |Φ|: Rudder: .0027°; Aileron: .037°

Graph.6.1.6-Maximum |r| [°/s]: Rudder: .0009; Aileron: .0061