



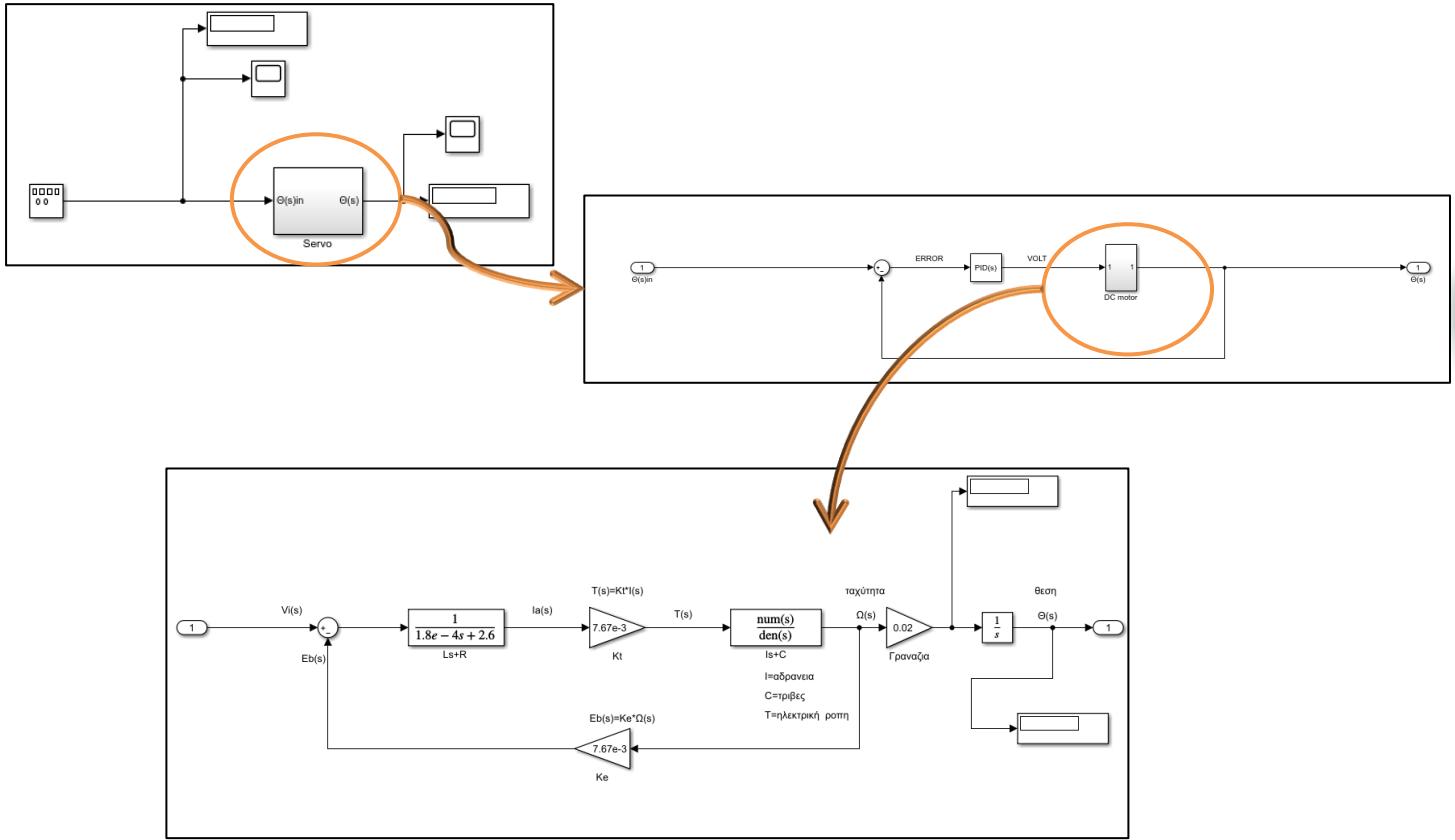
MECHATRONICS

Servo-motor Simulation

Φωτεινή Κολίση 48038

MATLAB®
&SIMULINK®

MODEL

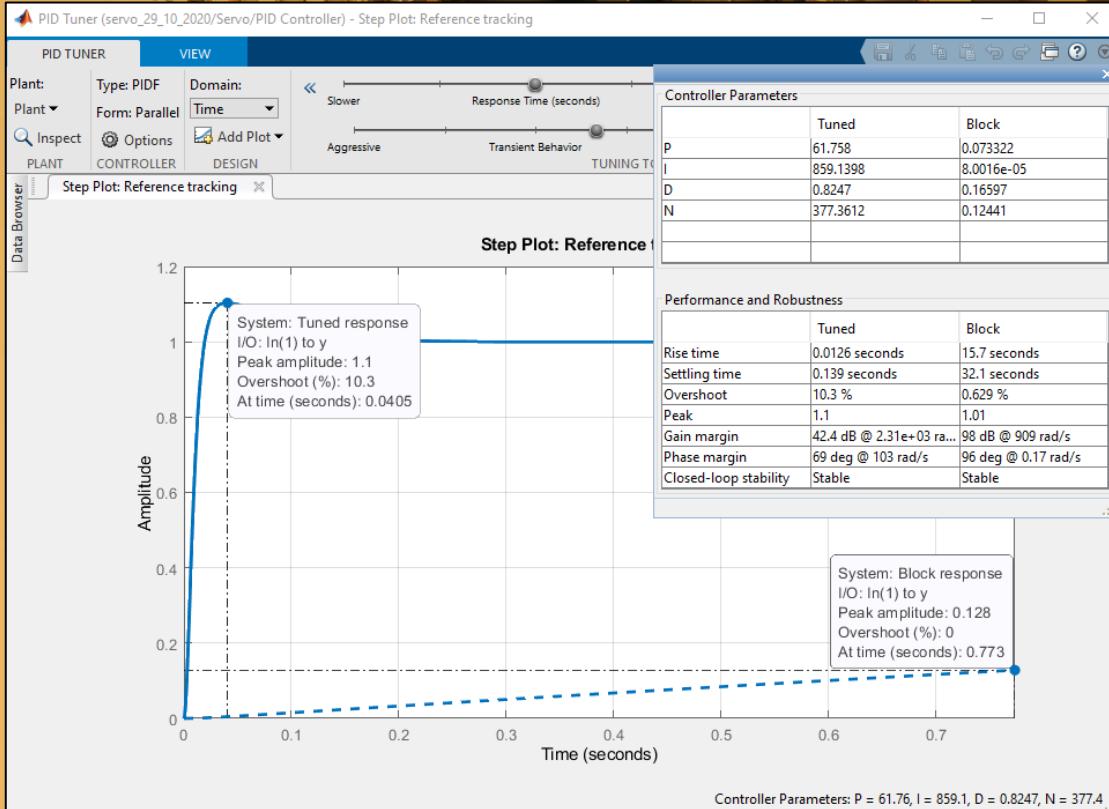


Presentation

Standards

Labvolt DC motor (model 8211-0A)

$$\begin{aligned}K_T &= 2.161 \text{ Nm/A} \\K_b &= 2.161 \text{ Vs/rad} \\J_m &= 0.47 \text{ Nms}^2/\text{rad} \\\omega_{\max} &= 101.108 \text{ rad/s} \\I_{\max} &= 1.5 \text{ A} \\\omega_{NL} &= 111.051 \text{ rad/s} \\P_{\max} &= 472.643 \text{ Watt} \\R_a &= 30.467 \Omega \\B_m &= 0.046 \text{ Nms/rad}\end{aligned}$$



PID Controller

Main Initialization Output Saturation Data Types State Attributes

Controller parameters

Source: internal

Proportional (P): 0.0733224326512507

Integral (I): 8.00159671983833e-5

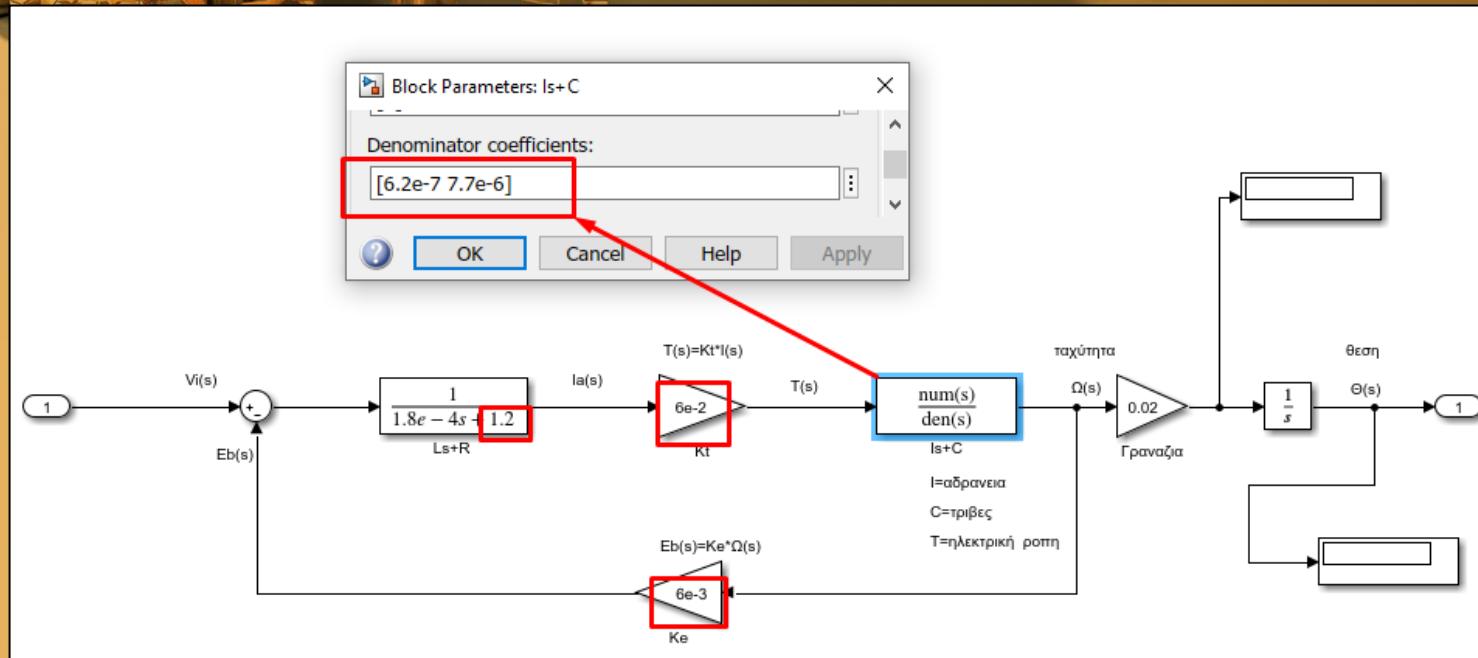
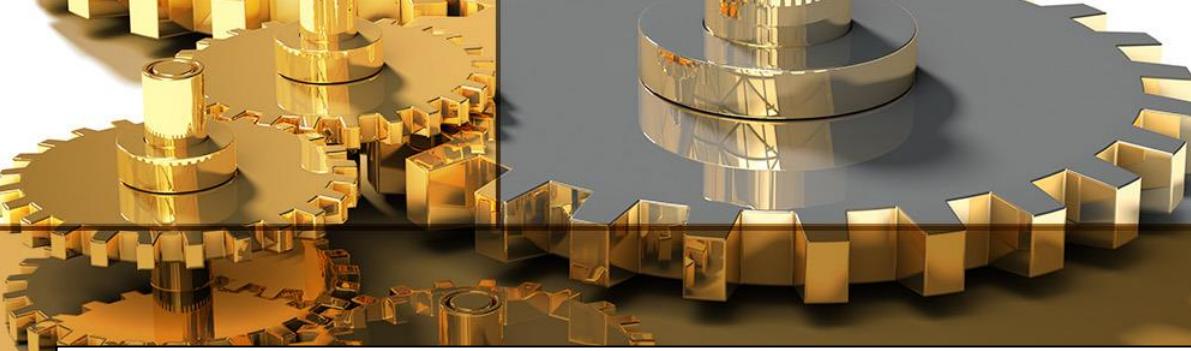
Derivative (D): 0.165969881672071

Use filtered derivative

Filter coefficient (N): 0.124406312032506

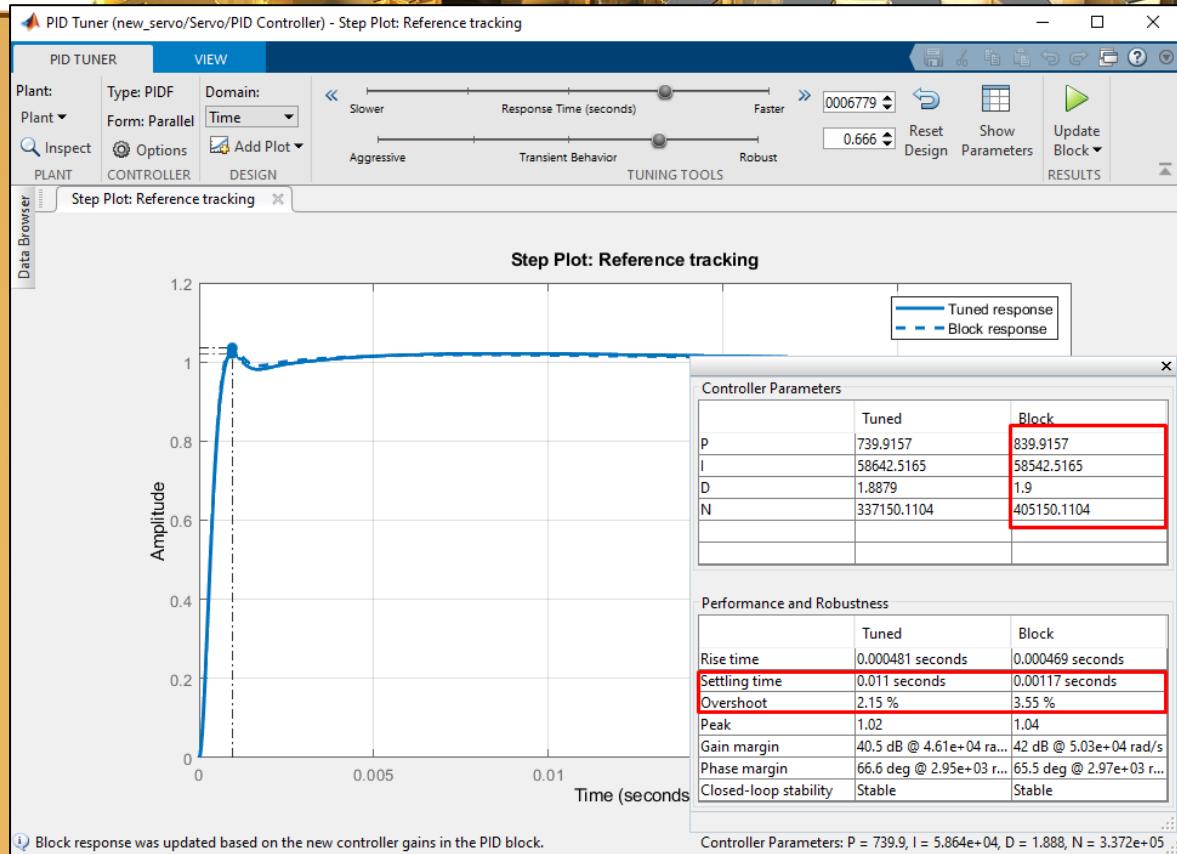
$$P + I \frac{1}{s} + D \frac{N}{1 + N \frac{1}{s}}$$

Customized Model



Specifications

Experimental separately excited DC motor



$$K_T = 0.06 \text{ Nm/A}$$
$$K_b = 0.06 \text{ Vs/rad}$$
$$J_m = 6.2 \times 10^{-4} \text{ Nms}^2/\text{rad}$$
$$I_{max} = 2 \text{ A}$$
$$P_{max} = 54 \text{ Watt}$$
$$R_a = 1.2 \Omega$$
$$B_m = 1 \times 10^{-4} \text{ Nms/rad}$$

Proportional (P):	839.9157
Integral (I):	58542.5165
Derivative (D):	1.9
<input checked="" type="checkbox"/> Use filtered derivative	
Filter coefficient (N):	405150.1104