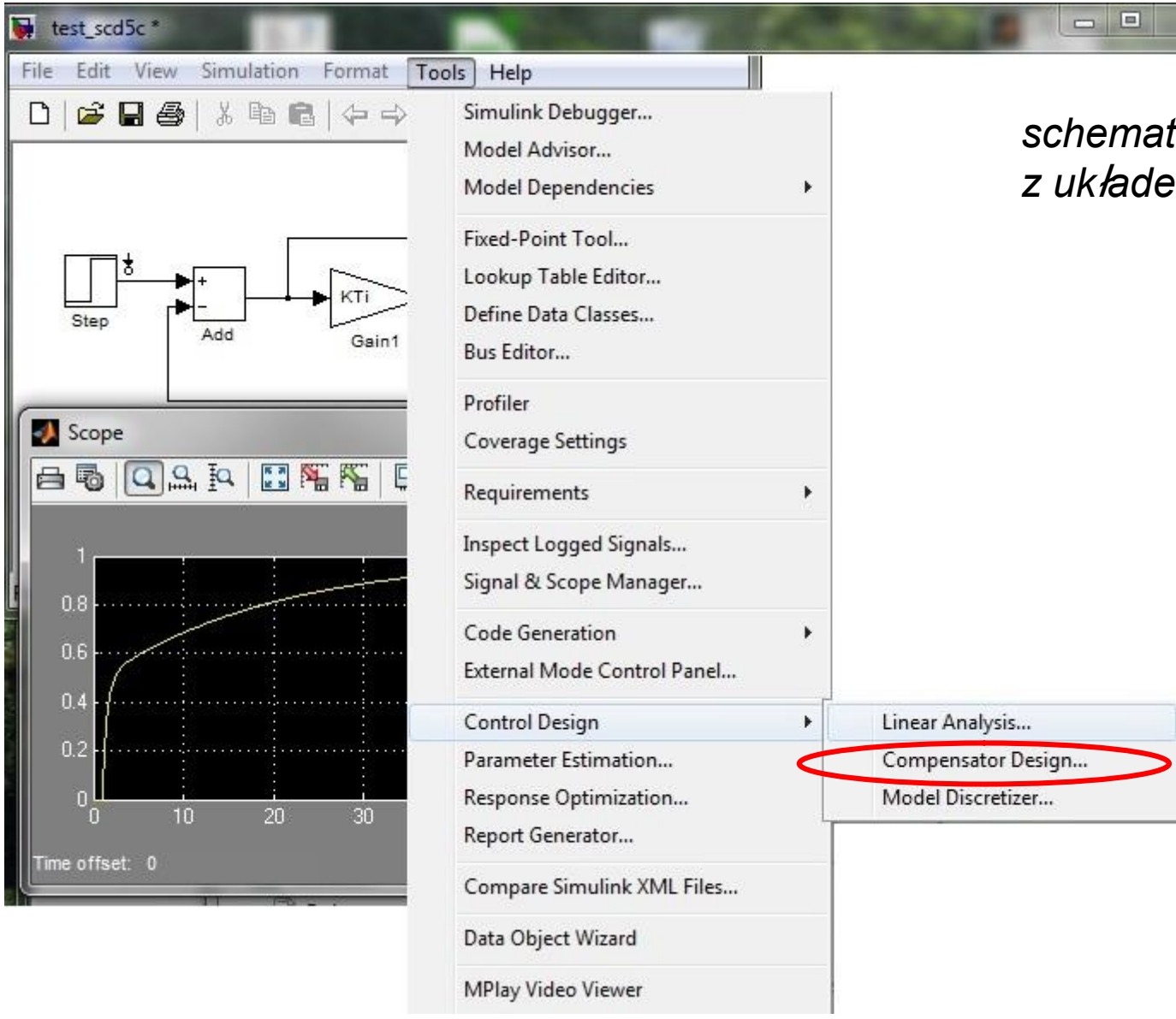
SISO Design

schemat → Tools → Control Design → Compensator Design

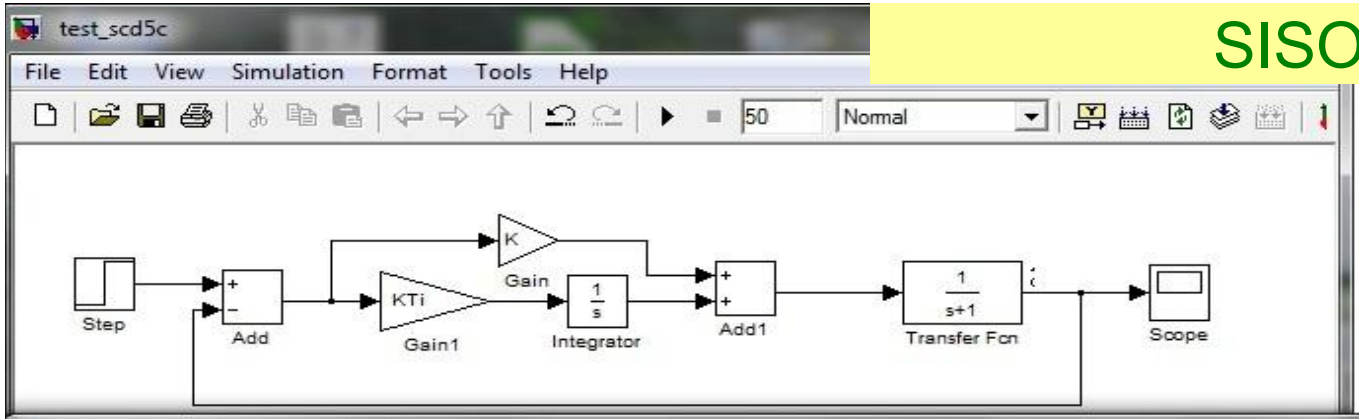


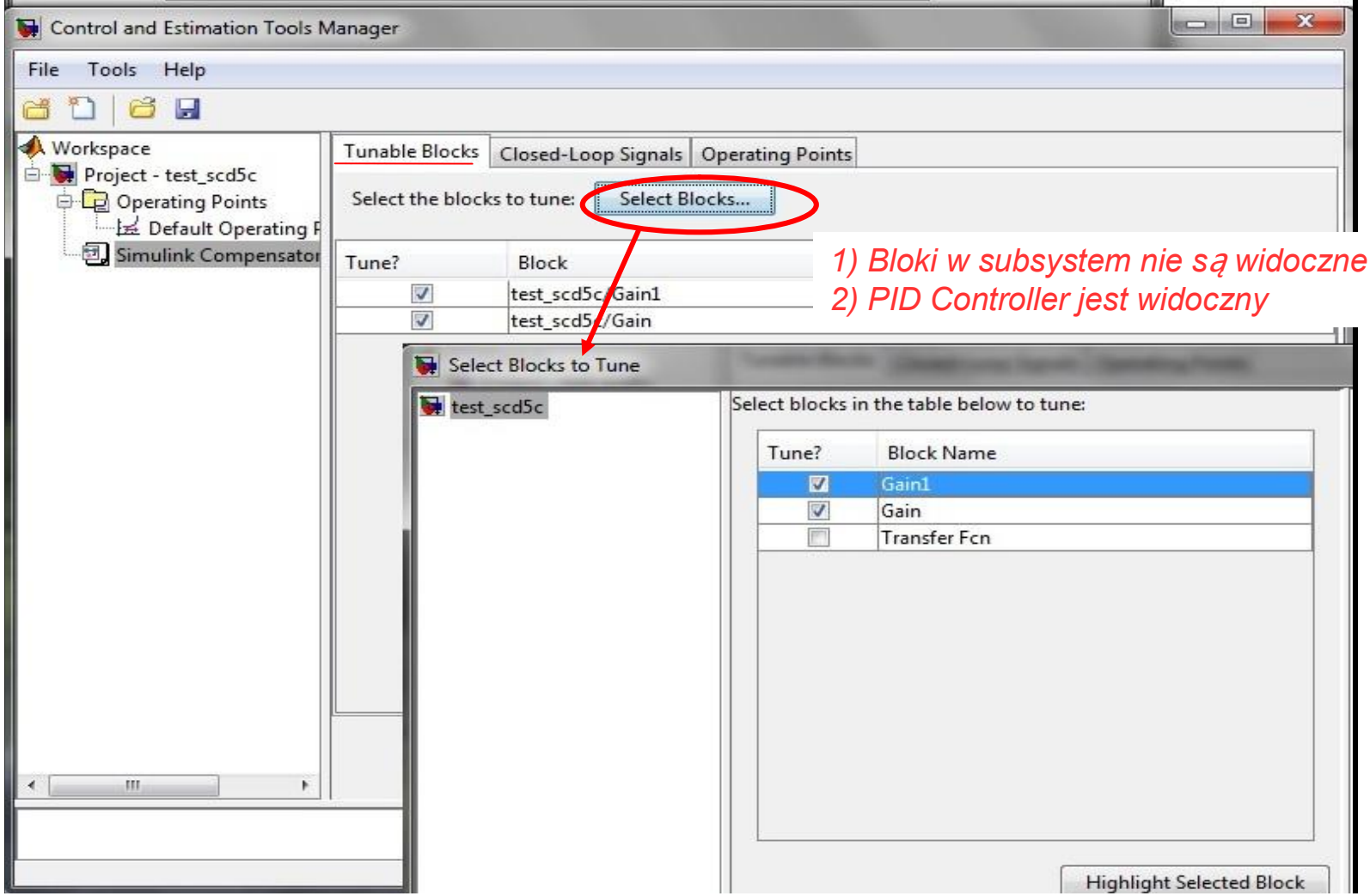
schemat = model obiektu wraz z układem regulacji

Matlab + Simulnik + Simulink Control Design

SISO Design

1.1) wskazanie bloków regulatora w układzie

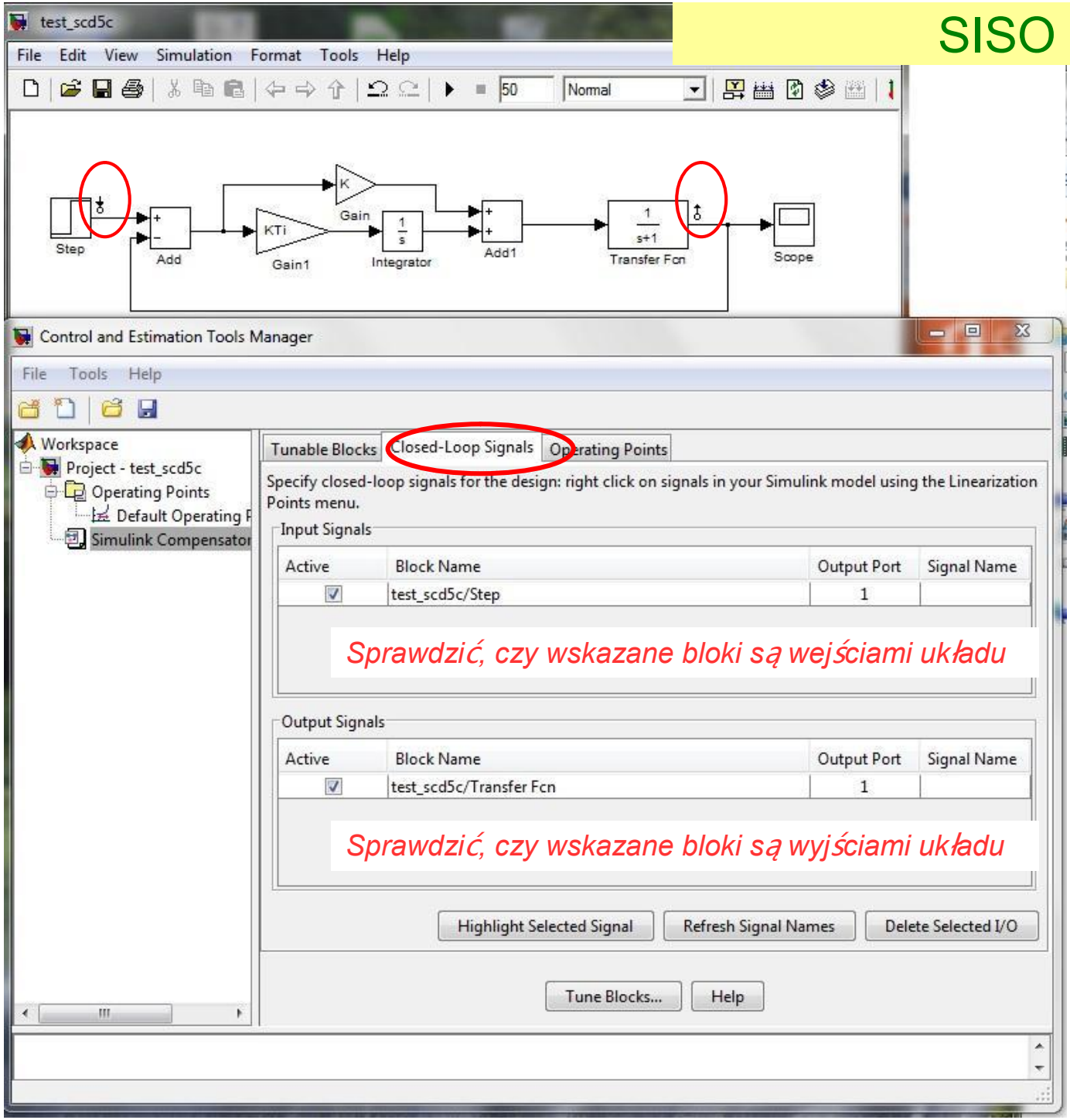




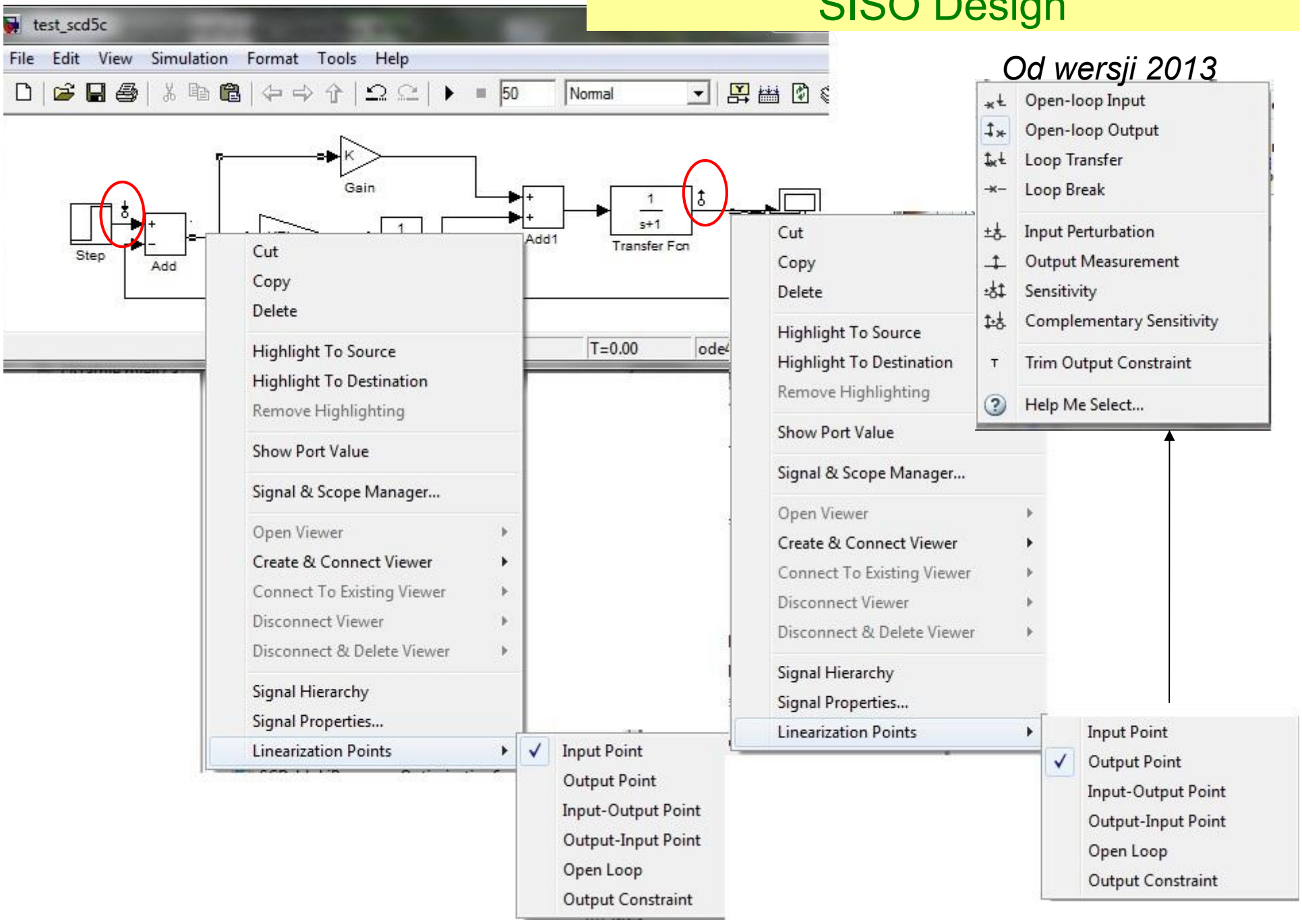
1) Bloki w subsystem nie są widoczne
2) PID Controller jest widoczny

SISO Design

1.2) wskazanie sygnałów IO w układzie

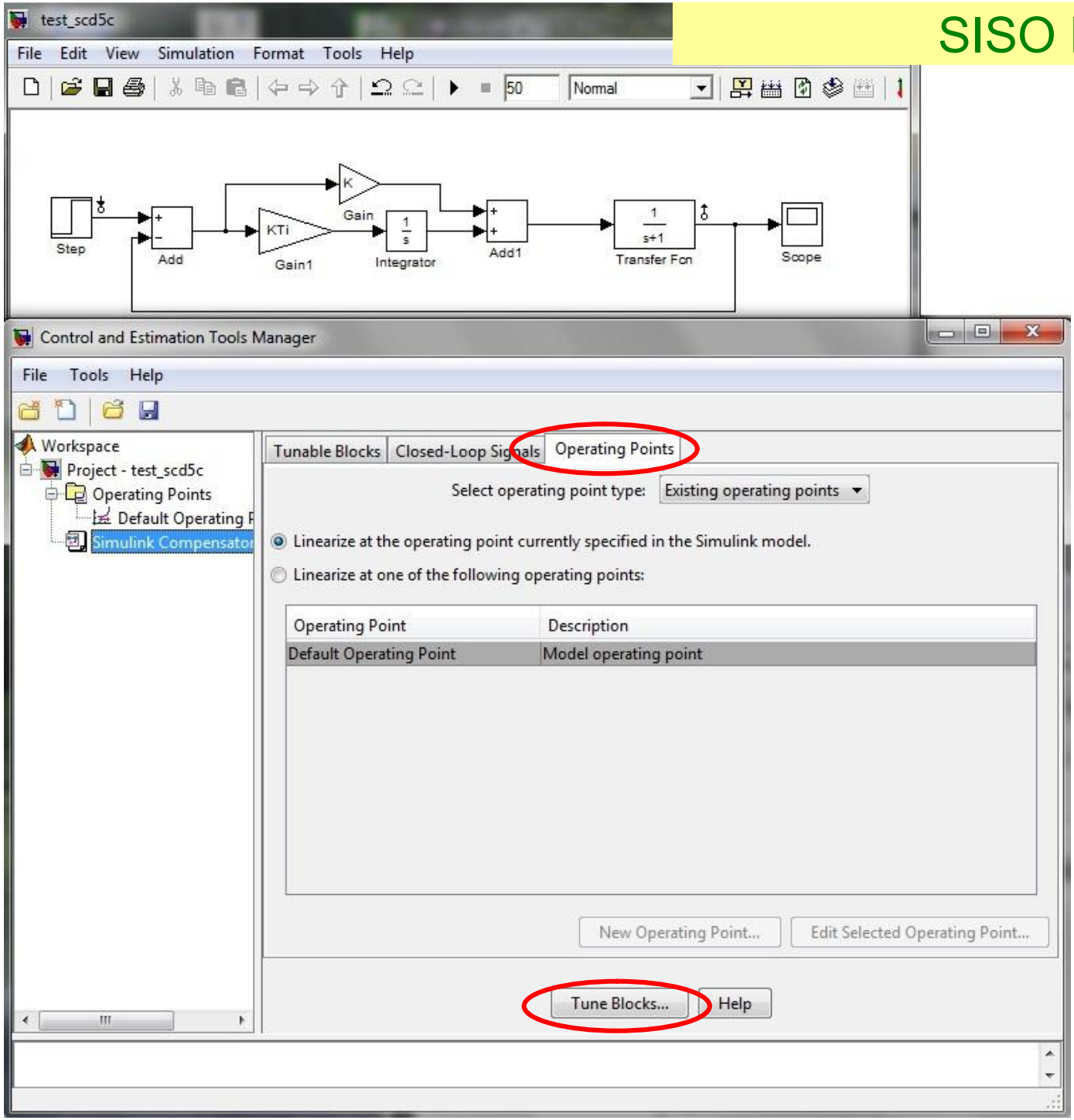


SISO Design

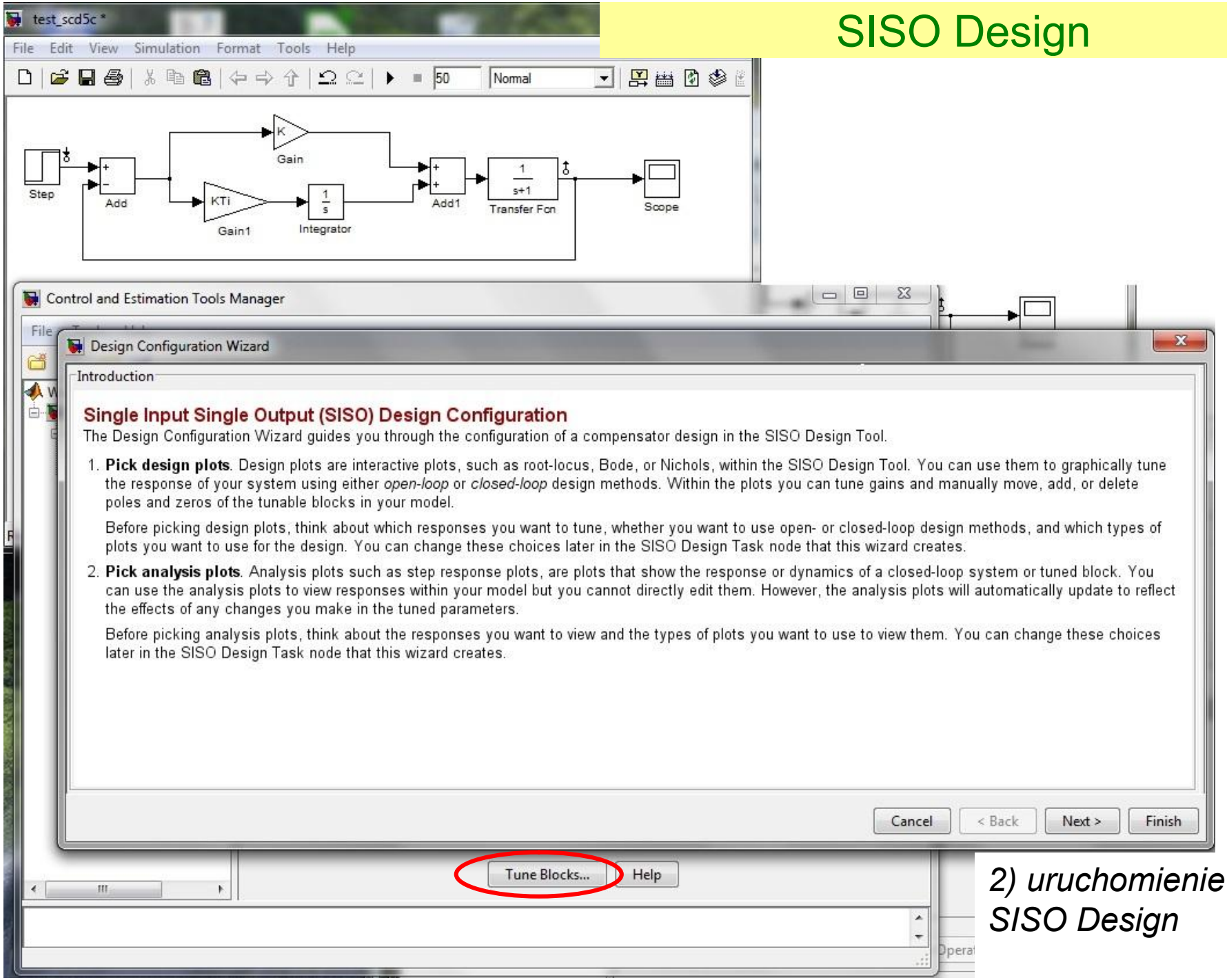

test_scd5c
File Edit View Simulation Format Tools Help
50
Normal
Step
Add
Gain
Add1
1
s+1
Transfer Fcn
T=0.00
Cut
Copy
Delete
Highlight To Source
Highlight To Destination
Remove Highlighting
Show Port Value
Signal & Scope Manager...
Open Viewer
Create & Connect Viewer
Connect To Existing Viewer
Disconnect Viewer
Disconnect & Delete Viewer
Signal Hierarchy
Signal Properties...
Linearization Points
Input Point
Output Point
Input-Output Point
Output-Input Point
Open Loop
Output Constraint
Od wersji 2013
Open-loop Input
Open-loop Output
Loop Transfer
Loop Break
Input Perturbation
Output Measurement
Sensitivity
Complementary Sensitivity
Trim Output Constraint
Help Me Select...
Input Point
Output Point
Input-Output Point
Output-Input Point
Open Loop
Output Constraint

SISO Design

1.3) wskazanie punktu pracy



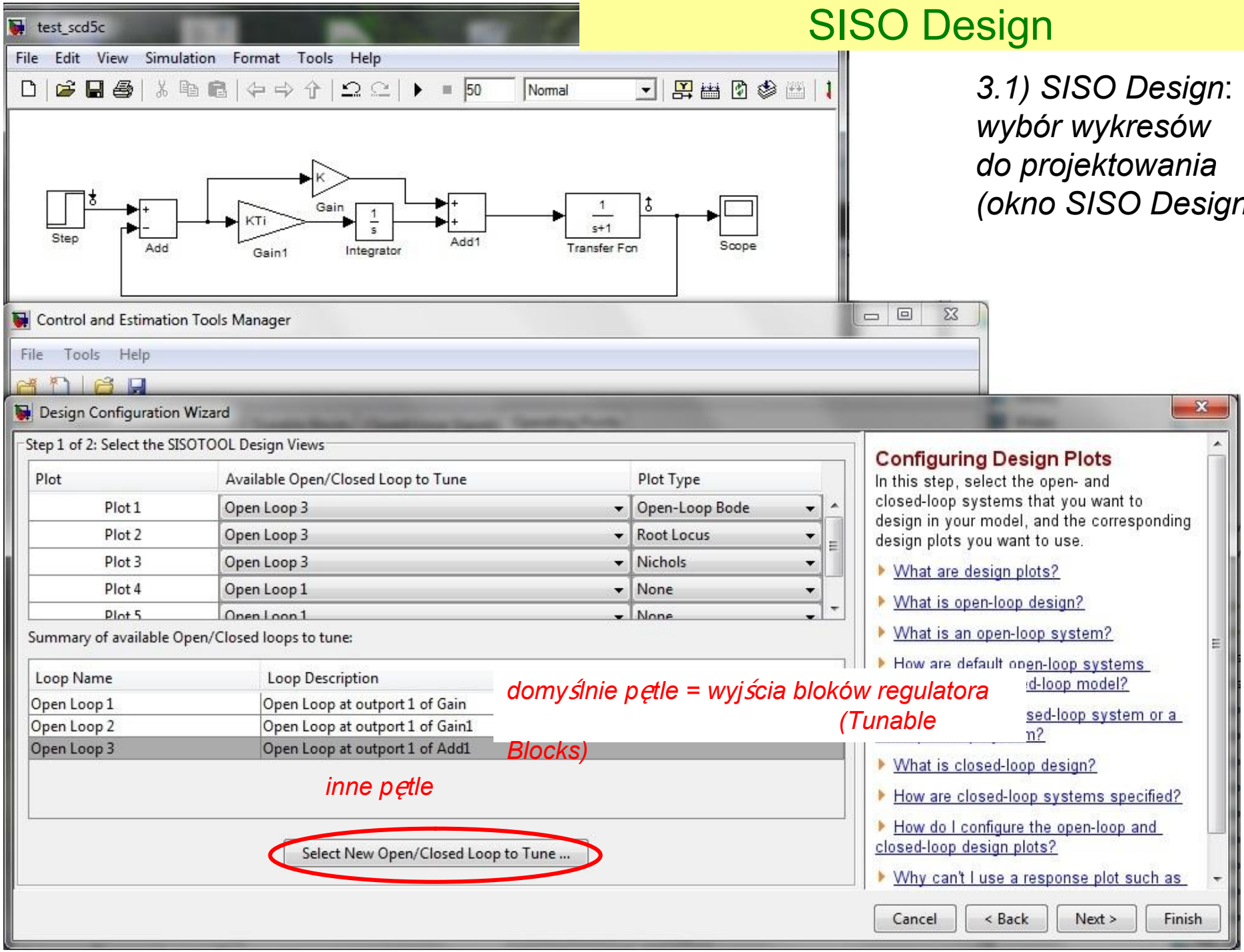
SISO Design



2) uruchomienie SISO Design

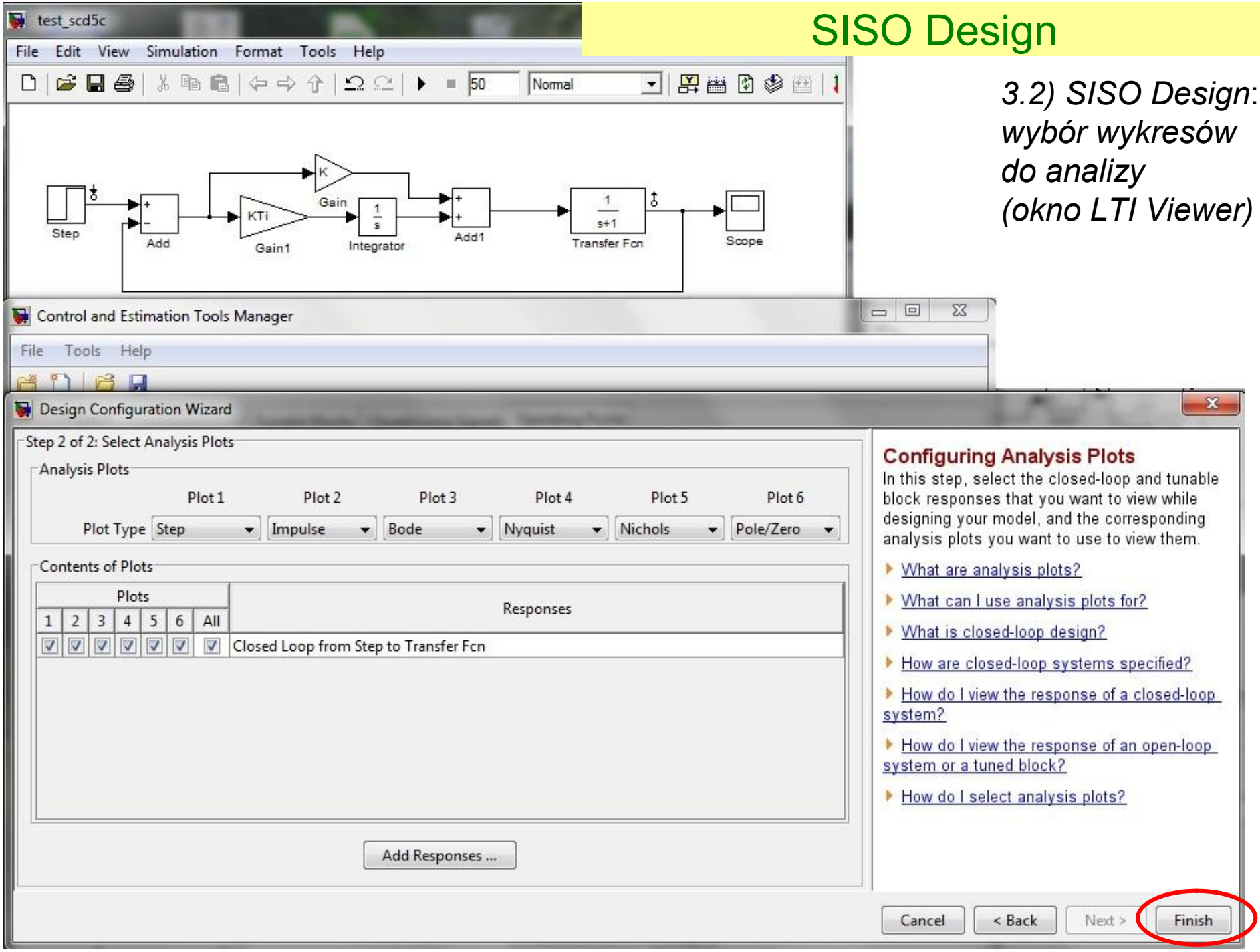
SISO Design

3.1) SISO Design: wybór wykresów do projektowania (okno SISO Design)



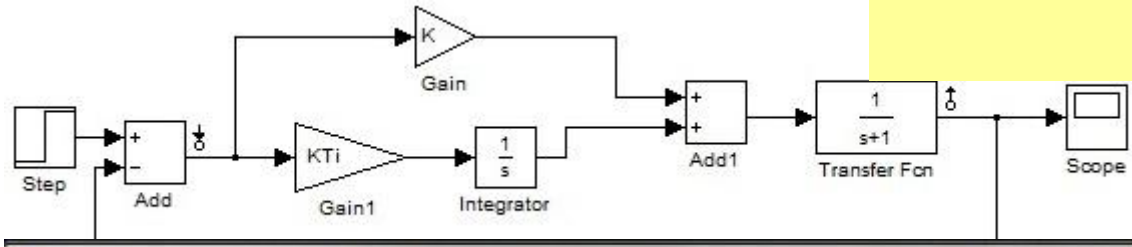
SISO Design

3.2) SISO Design: wybór wykresów do analizy (okno LTI Viewer)



SISO Design

4.1) SISO Design - układ



Control and Estimation Tools Manager

File Edit Tools Help

Workspace
Project - test_scd5c
Operating Points
Default Operating P
Simulink Compensator
SISO Design Task
Design History
Initial Desig
Design Operatir

Architecture | Compensator Editor | Graphical Tuning | Analysis Plots | Automated Tuning

```
Compensator Design Summary - test_scd5c

Simulink Blocks to Tune:
test_scd5c/Gain
test_scd5c/Gain1

Closed Loop Input Signals:
test_scd5c/Step, output port 1

Closed Loop Output Signals:
test_scd5c/Transfer Fcn, output port 1
```

Sprawdzić poprawność zdefiniowanej konfiguracji

Loop Configuration... — Configure additional loop openings for multi-loop design.

System Data ... — Import data for compensators and fixed systems.

Sample Time Conversion ... — Change the sample time of the design.

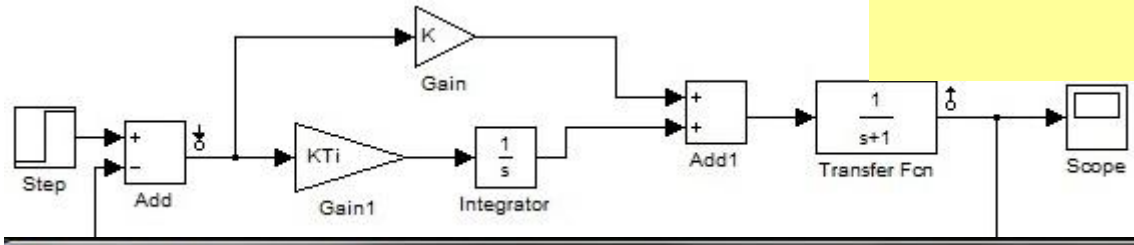
Multimodel Configuration ... — Change the nominal plant and multimodel options.

Store Design | Update Simulink Block Parameters | Automatically update block parameters

SISO Design Task Node.

SISO Design

4.2) SISO Design - regulator



Control and Estimation Tools Manager

File Edit Tools Help

Workspace
Project - test_scd5c
Operating Points
Default Operating P
Simulink Compensator
SISO Design Task
Design History
Initial Desig
Design Operatir

Architecture | Compensator Editor | Graphical Tuning | Analysis Plots | Automated Tuning

Compensator

All Gain Blocks x

Pole/Zero | Parameter

Parameter	Value	Min Value	Slider	Max Value
test_scd5c/Gain	1	0.1		1
test_scd5c/Gain1	0.1	0.01		0.1

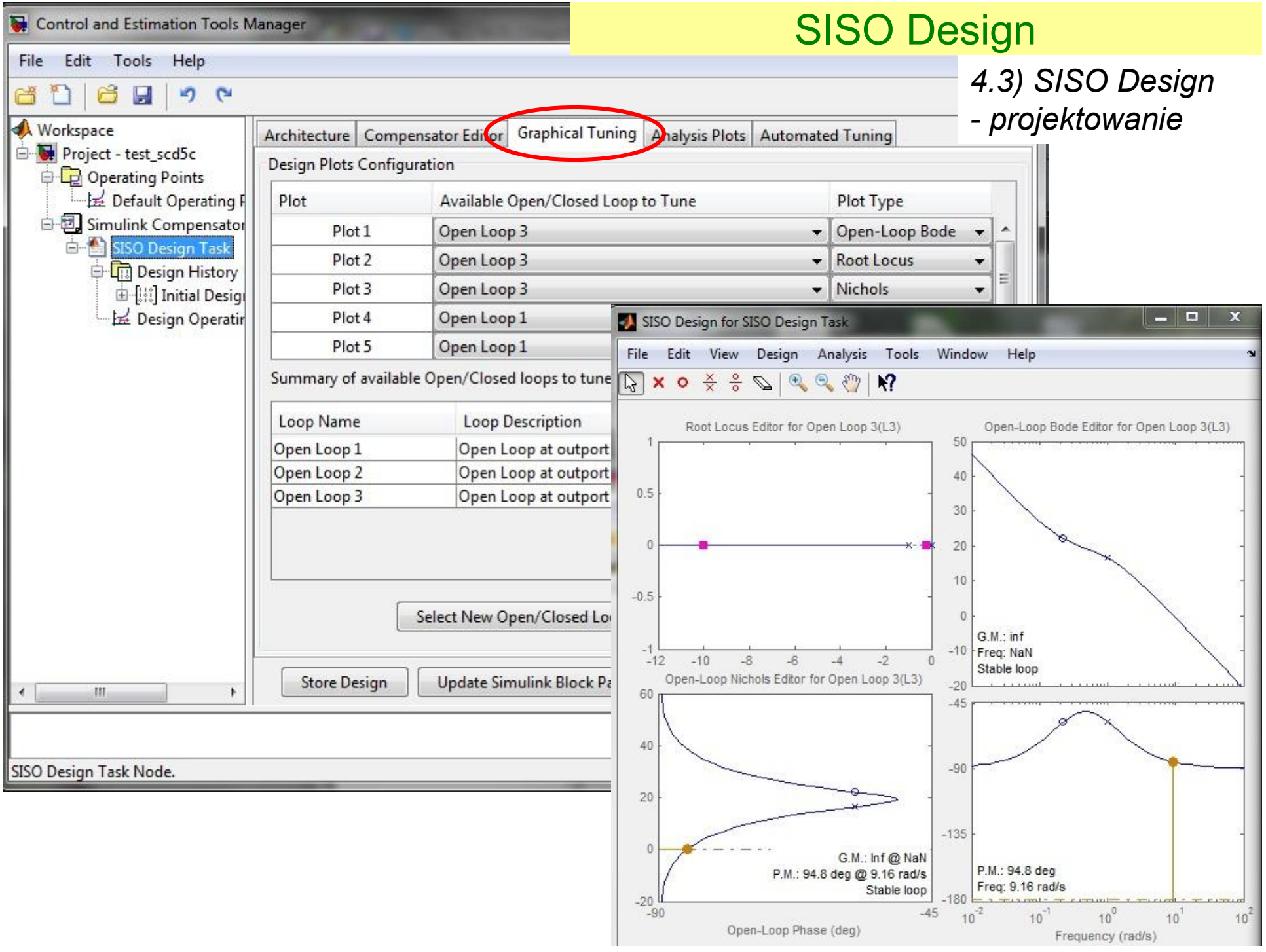
Select a parameter in the table and tune it manually

Store Design | Update Simulink Block Parameters | Automatically update block parameters

SISO Design Task Node.

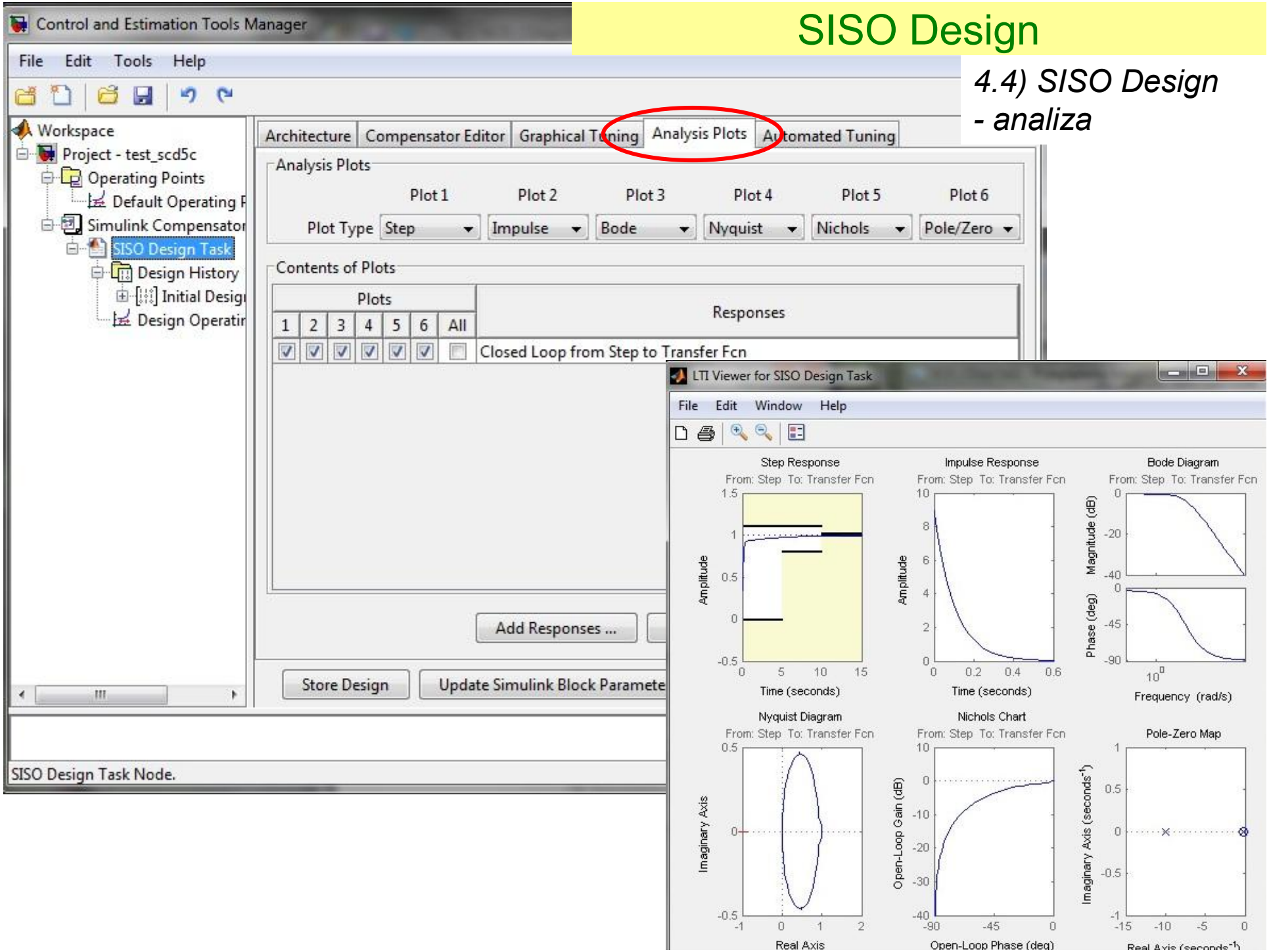
SISO Design

4.3) SISO Design - projektowanie



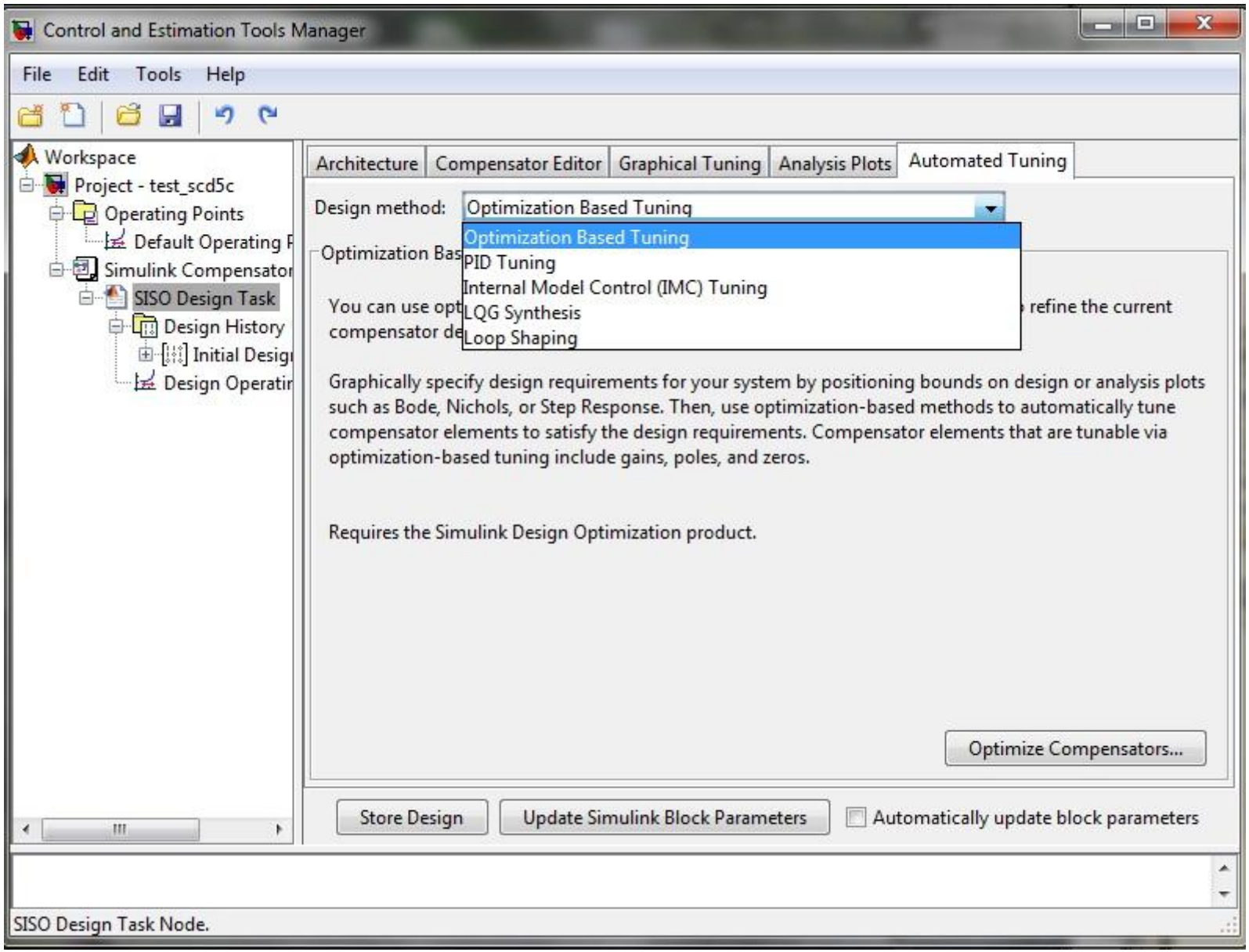
SISO Design

4.4) SISO Design - analiza



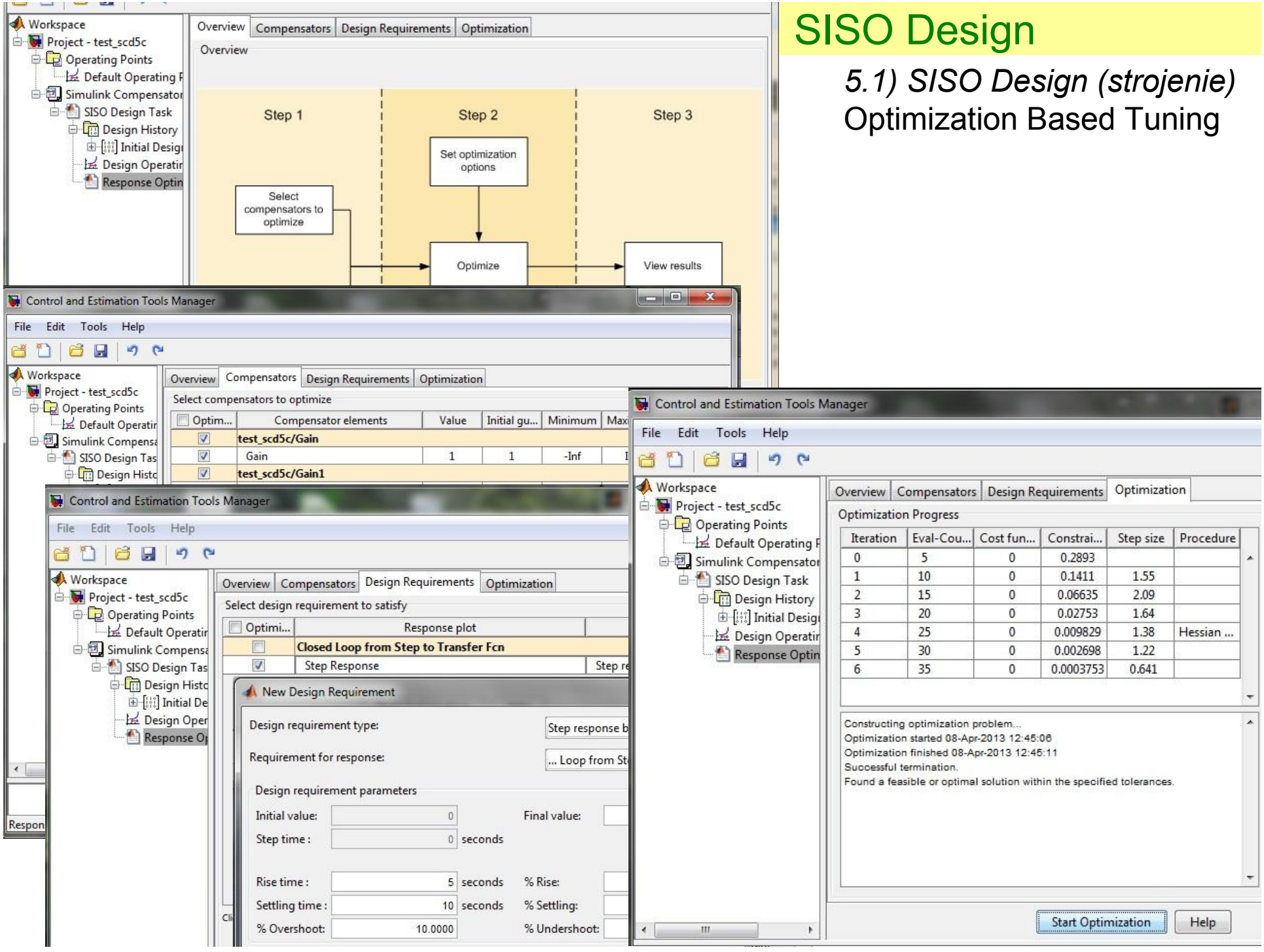
SISO Design

5) SISO Design
- strojenie



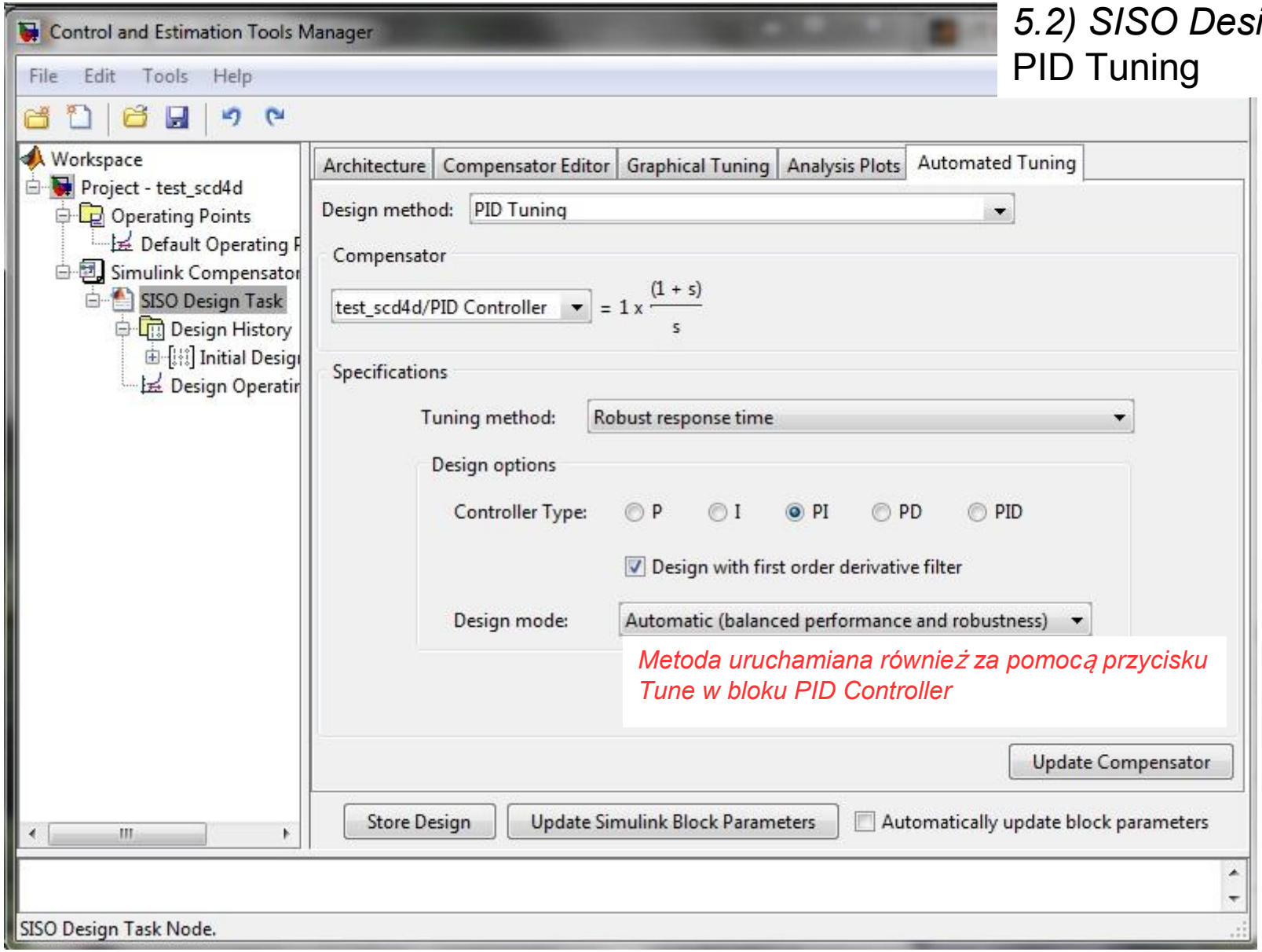
SISO Design

5.1) SISO Design (strojenie)
Optimization Based Tuning



SISO Design

5.2) SISO Design (strojenie)
PID Tuning

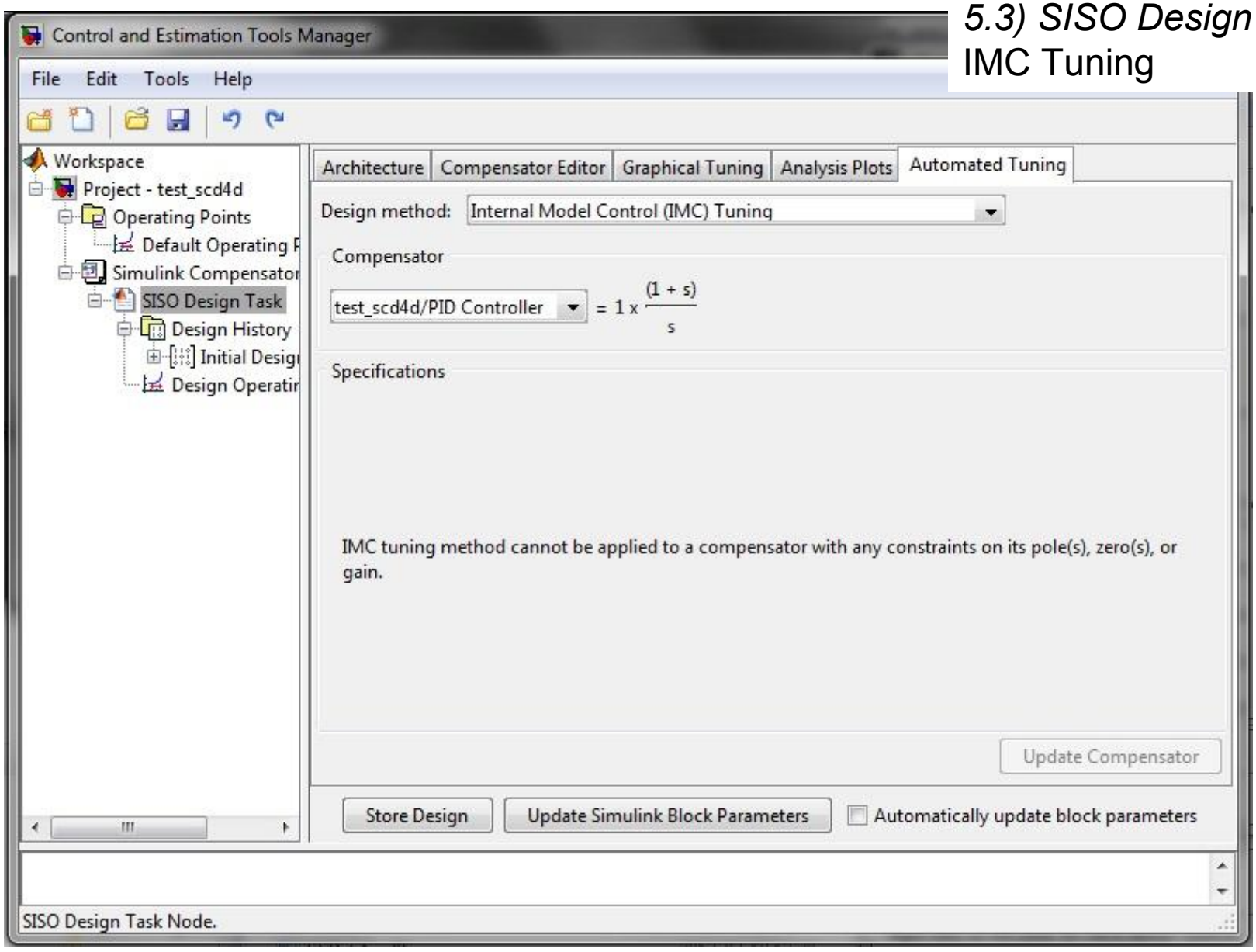


Metoda uruchamiana również za pomocą przycisku Tune w bloku PID Controller

Uwaga: Wymaga użycia na schemacie bloku PIDController

SISO Design

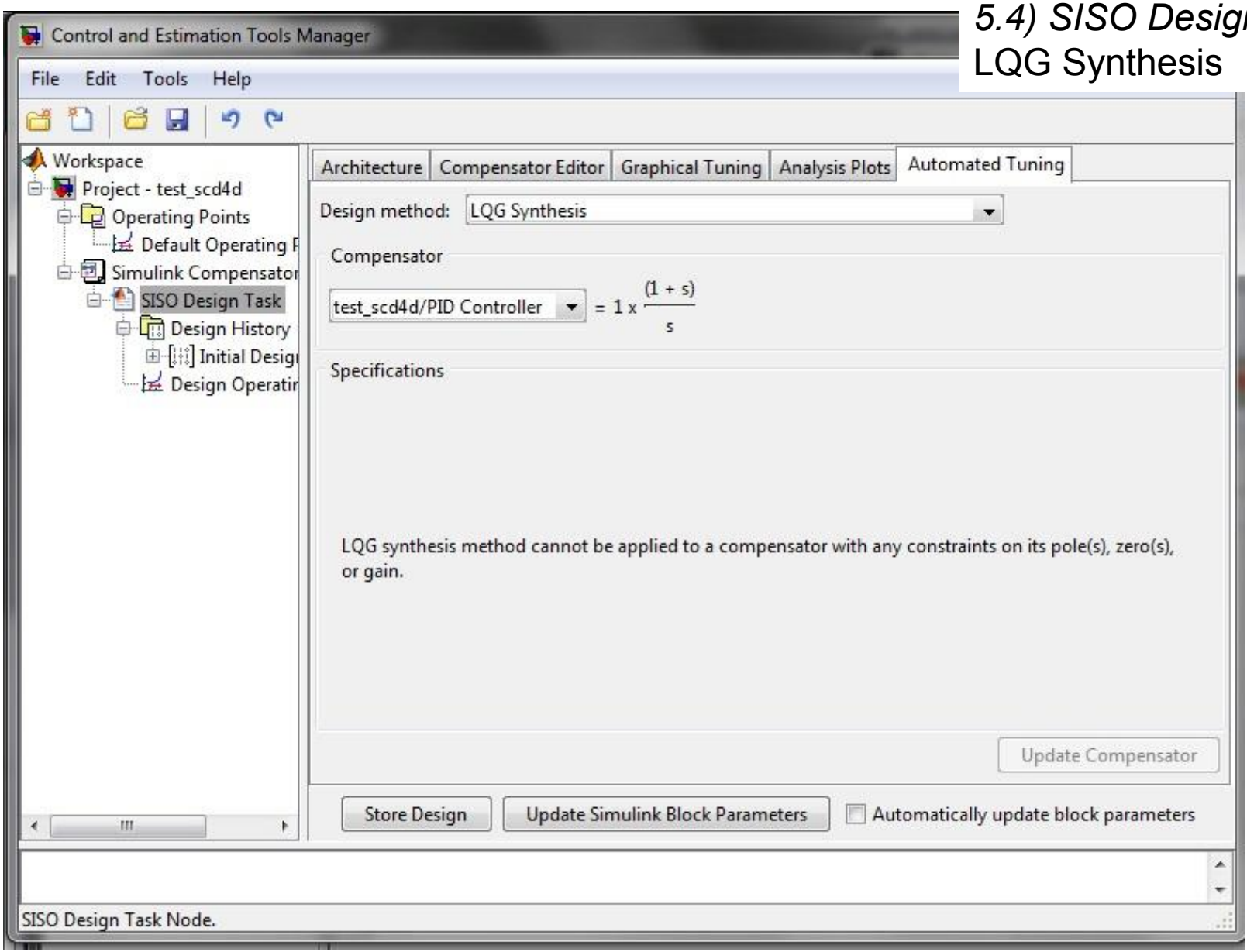
5.3) SISO Design (strojenie)
IMC Tuning



Uwaga: Wymaga użycia na schemacie bloku PIDController

SISO Design

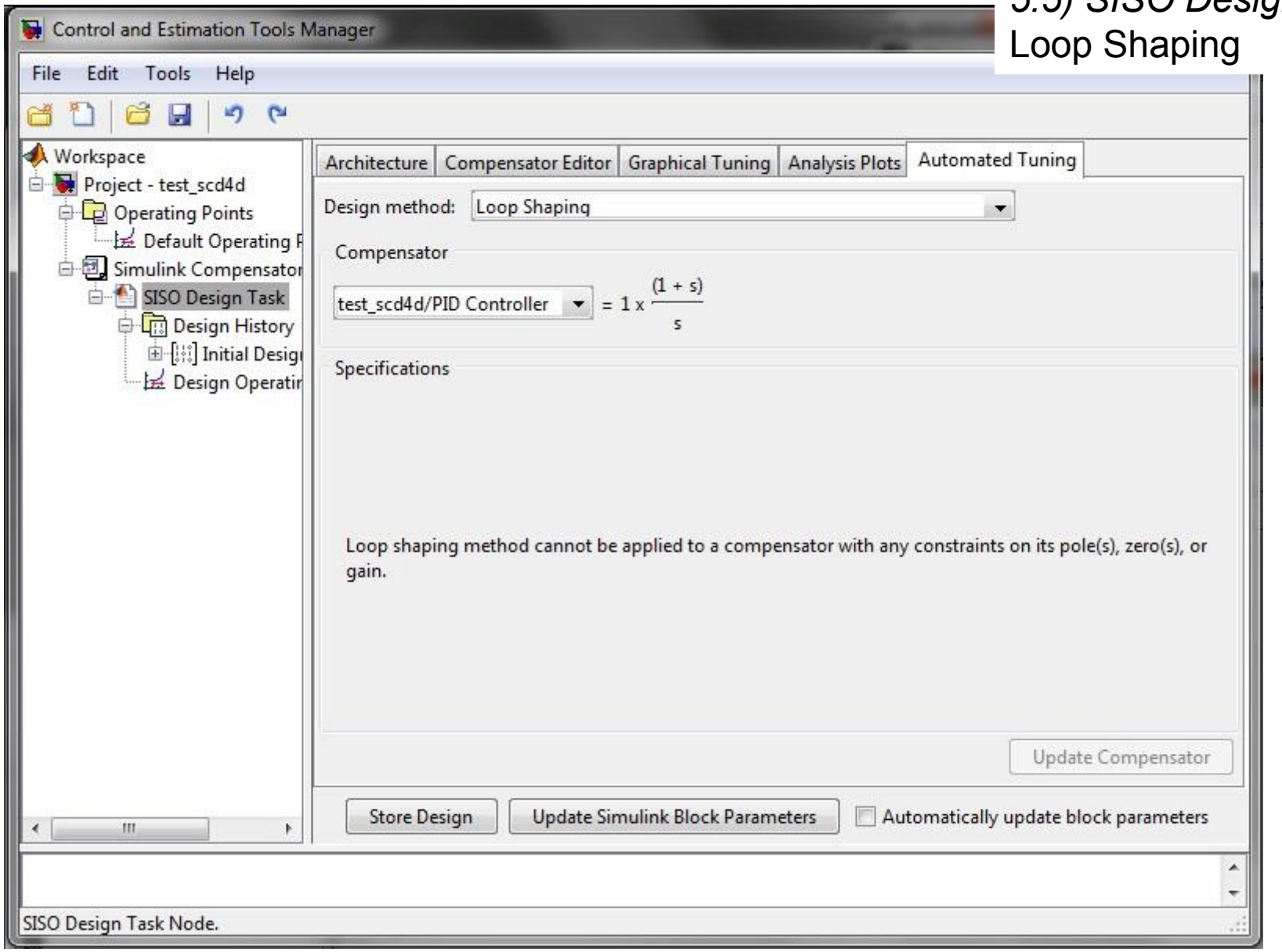
5.4) SISO Design (strojenie)
LQG Synthesis



Uwaga: Wymaga użycia na schemacie bloku PIDController

SISO Design

5.5) SISO Design (strojenie)
Loop Shaping



Uwaga: Wymaga użycia na schemacie bloku PIDController

SISO Design

Zastosowanie:
- schemat modelu obiektu
    - z własnym blokiem regulatora
    - z blokiem PID Controller
- definicja:
    - wskazanie bloków regulatora,
    - lub wybór typu regulatora
- automatyczny dobór nastaw
- wybór metody (ograniczenia)
- strojenie graficzne (optymalizacja)