

Control in a rotating frame

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1. Simscape Model
2. Simscape Model
3. Identification in the rotating frame
4. Identification in the cartesian frame
5. Identification in the cartesian frame
6. Control result

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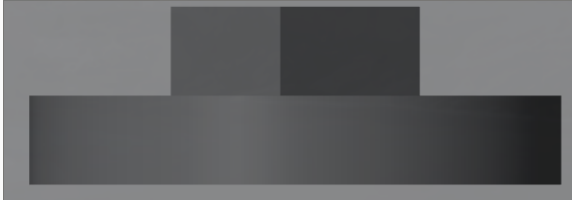


Figure 1 – *Screen of Simscape multibody model*

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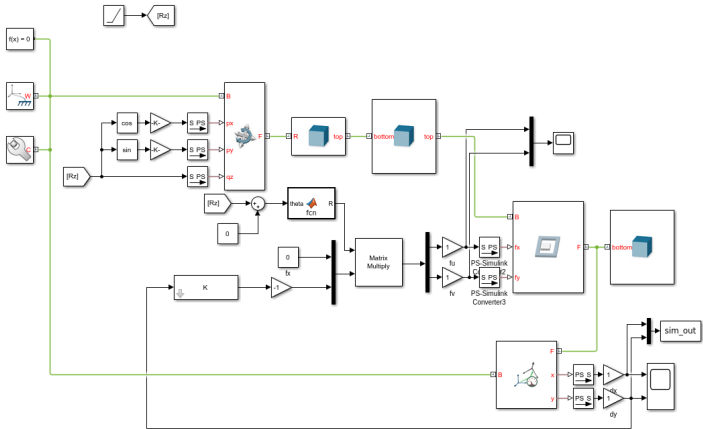


Figure 2 – *Simulink Blocks*

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The rotation speed increase the coupling between the rotating actuators and sensors (figure 3).

From: Fu

Magnitude (dB) ; Phase (deg)

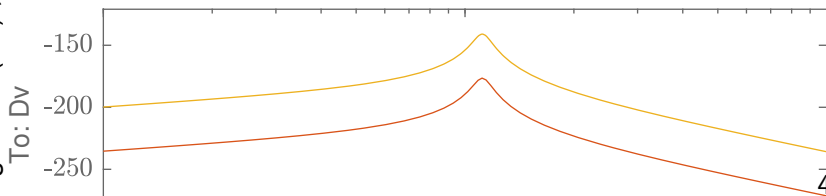
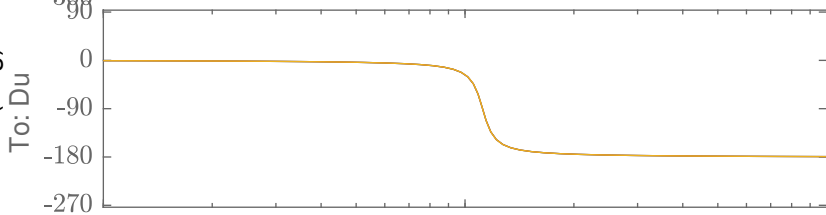
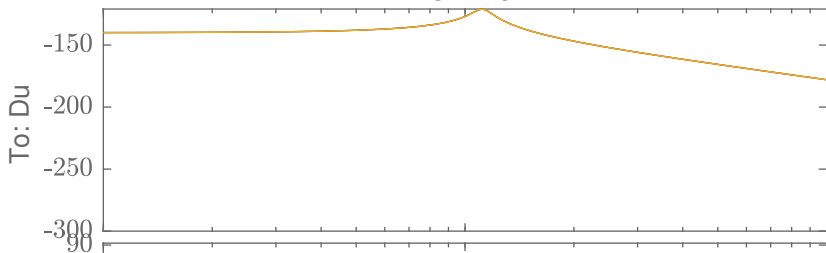


Figure 3 – *Transfer function from forces to displacement in the rotating frame*

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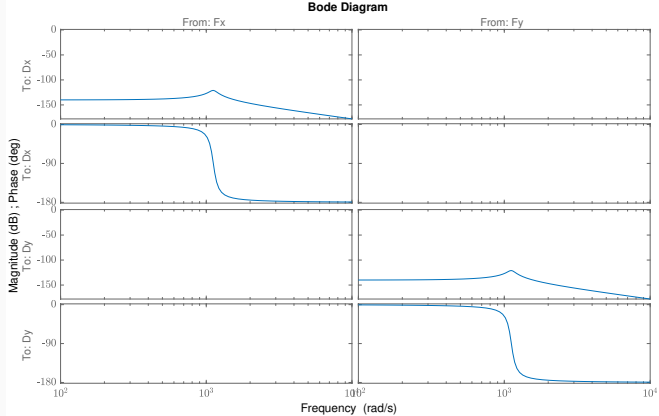


Figure 4 – *Plant from force to displacement in the cartesian frame*

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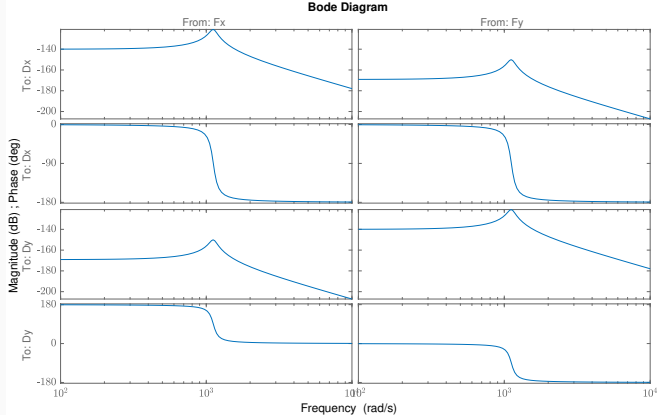


Figure 5 – *Plant from force to displacement in the cartesian frame with small angle estimation error*

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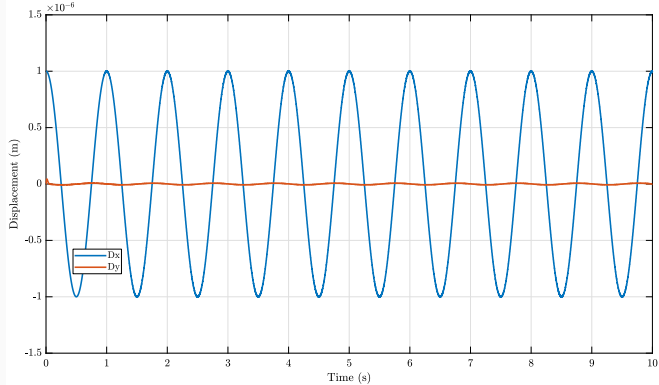


Figure 6 – *Control result with a simple PID*