DATA EXPERIMENTS

$t = 30s$
$V_a =$ SQUAREWAVE

consistem.m
qube_servo_used_for_experiment.slx

PENDULUM (only) : { pendulum_smorz 2.mat
" 3.mat

$\phi_{INT} = 90°$

$\theta = 135°$ (fixed manually)
$\dot{\theta} = 0$

DC MOTOR W/O DISC : { omega1.mat
current1.mat

$f = 0,25 Hz$ (SQUAREWAVE)
$Ampl = 1V$

$5 \tau_{mecc} \simeq 97 ms \longrightarrow \tau_{mecc} \simeq 19 ms$

β estimation $\longrightarrow \frac{S}{\beta} = 19ms \longrightarrow \beta = 2,105 \cdot 10^{-4}$

DC MOTOR + ARM : { omega2.mat
(CABLE not attached)   current2.mat
$\theta_{MAX} = ENDSTOP = \pm 135°$

==NT: the arm Hub has
been taken up a bit==

$f = 0,1 Hz$
$GAIN = 1$

$\tau_{mecc} = \frac{4,2s}{5} = 0,84 s$

$S_{TOT} = \tau_{mecc} \cdot \beta = 0,84 \cdot 2,105 \cdot 10^{-4} = 176,82 \cdot 10^{-6} \, Kg \cdot m^2$

$S_{ARM + SENSOR} = S_{TOT} - S_{DC MOTOR} = 176,82 \cdot 10^{-6} - 4 \cdot 10^{-6}$

$= 172,82 \cdot 10^{-6}$

DC MOTOR + ARM : { omega3.mat
(CABLE not attached)   current3.mat
$f = 1Hz$ theta3.mat
$GAIN = 1$ input3.mat

DC MOTOR + ARM : { 4.mat
(CABLE attached and fixed)
by hand

$f = 2 Hz$
$GAIN = 1$

DC MOTOR + ARM : { 5.mat
(CABLE attached and not)
fixed by hand

$f = 2 Hz$
$GAIN = 1$

COMPLETE (w/ CABLE fixed by hand) : { 6.mat

IMPULSE { $\Delta t = 50 ms$
$GAIN = 3$

$\tau_{mecc} \phi \simeq 3,3 s$
$\tau_{mecc} \theta \simeq 3,3 s$

$\frac{T_{IN}}{2} \gg 5 \tau_{mecc} \longrightarrow f_{IN} \ll \frac{1}{10 \cdot \tau_{mecc}} = 0,0303 Hz$

Exp : $f_{IN} = 35 Hz \longrightarrow$ filtered, w/ very small
(negligible) oscillation

COMPLETE (w/o CABLE fixed) : { 7.mat

3 SQUAREWAVE for V_a
1: $f = 2 Hz$
2: $f = 5 Hz$ $GAIN = 1$
3: $f = 7 Hz$

COMPLETE (w/o CABLE fixed) : { 8.mat

3 SINUSOIDAL for V_a
1: $f = 2 Hz$
2: $f = 5 Hz$ $GAIN = 1$
3: $f = 7 Hz$

COMPLETE (w/o CABLE fixed) : { 9.mat

3 SINUSOIDAL for V_a
1: $f = 2 Hz$
2: $f = 10 Hz$ $GAIN = 1$
3: $f = 20 Hz$