

ERR 01

channel 2 \rightarrow slow servo 10mV div

channel 1 \rightarrow fast servo

\rightarrow slow int = 50

fast int = 20k

diff gain = 6dB

fast diff = 25k

Gain = 30 dB

fast ~~to~~ -ve

slow +ve

\hookrightarrow high drift,

Observations

* What does ^{user} "reset" do?

→ Continuation of stamping / clapping unlocks / locks

→ drifting \Rightarrow allows unlock / lock by itself

→ Sudden tp allows if noise is concentrated in side band or carrier

↳ allows to see sign

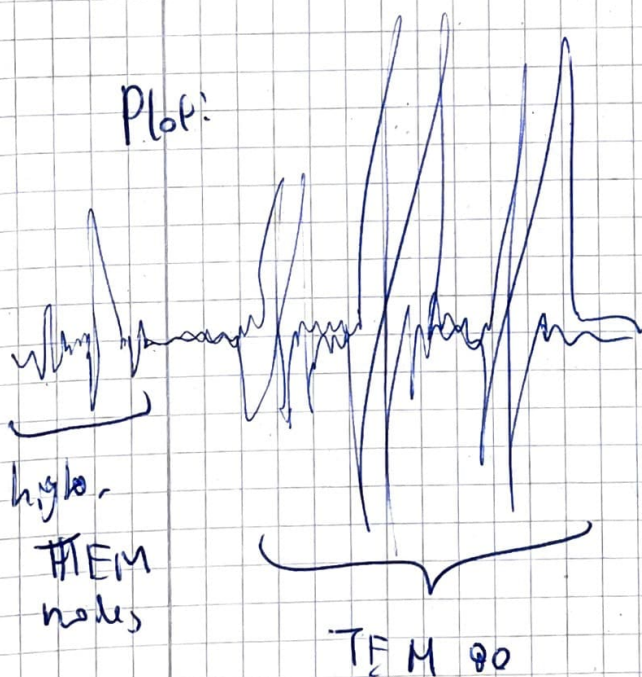
→ in our case: fast = true, slow = -ve

→ Small resonance peaks \approx higher TEM modes

↳ seen when lock is unstable.

→ blinks when not laser locked.

Plot:



→ offset must be s.f.

both CH1, CH2

offset to 0.

→ use slow offset to make it sym. then

use fast offset.

What happens when we modify PID parameters?

x green = slow (CH2)
yellow = fast (CH1)

slow int \rightarrow out of lock

fast gain \rightarrow $\nearrow \Rightarrow$ decrease noise for both
fast & slow

fast diff / filter \rightarrow out of lock

~~fast~~ diff gain \rightarrow did nothing

slow gain \rightarrow controls lock

$\searrow \searrow \Rightarrow$ unlock, $\nearrow \Rightarrow$ not much.

offset \rightarrow don't touch after lock.

gain limit \rightarrow did nothing.

$\Rightarrow \pm 40 \text{ mV}$ for fast, $\pm 20 \text{ mV}$ for slow
in general.

Mon1 \rightarrow notifies channel 1

\rightarrow slow error \rightarrow local fast error \rightarrow slow error
width

\rightarrow Ramp \rightarrow increase to $\pm 1 \text{ V}$, $\pm 0.1 \text{ V}$ width

- Bias $\rightarrow \pm 5 \text{ mV}$ width
- fast $\rightarrow \pm 200 \text{ mV}$
- slow $\rightarrow \pm 50 \text{ mV}$, shifts up in voltage
- CHA \rightarrow gives width \sim fast
- CHB \rightarrow shifts up, $\sim \pm 5 \text{ mV}$

MON 2 (Green)

- slow err $\rightarrow \pm 20 \text{ mV}$
- ramp \rightarrow goes to 1 V , $\pm 0.1 \text{ V}$ width
- bias \rightarrow shift to $\sim 0.5 \text{ mV}$, $\pm 0.5 \text{ mV}$
- fast $\rightarrow \pm 200 \text{ mV}$
- slow \rightarrow push to $\sim 580 \text{ mV}$, $\pm 50 \text{ mV}$
- CHA $\rightarrow \pm 40 \text{ mV}$,
- CHB $\rightarrow \pm 0.5 \text{ mV}$, shift to 25 mV .
- fast err $\rightarrow \pm 40 \text{ mV}$.

Ring lock down

- Best parameters in picture
- Trigger 70mv, repeat ~~with~~ mole,
- 32 times, ring-down test

lock 4, ~~is~~ _{prg} → with optimal PID parameters.

Sagane effect

→ frequency PID stabilization.

→ PID parameters:

KP: 0.2937 KD: 0.0, KI = 0.0040

Setpoint = 0.0100, sample rate = 62.50 MHz.

→ flip direction of rotator → flip + - terminal

~~2000~~ ~~2000~~

→ ~~2000~~ ~~2000~~

→ higher Volt age ⇒ ~~used~~ ~~used~~ sagane not properly
seen (heat)

→ faulty equipment?

high V

\Rightarrow unlocks easier

\Rightarrow less measurement time.

Now PID parameters:

$$K_P = 0.2037$$

$$K_I = 0.040$$

$$K_D = \text{offset} = 0$$

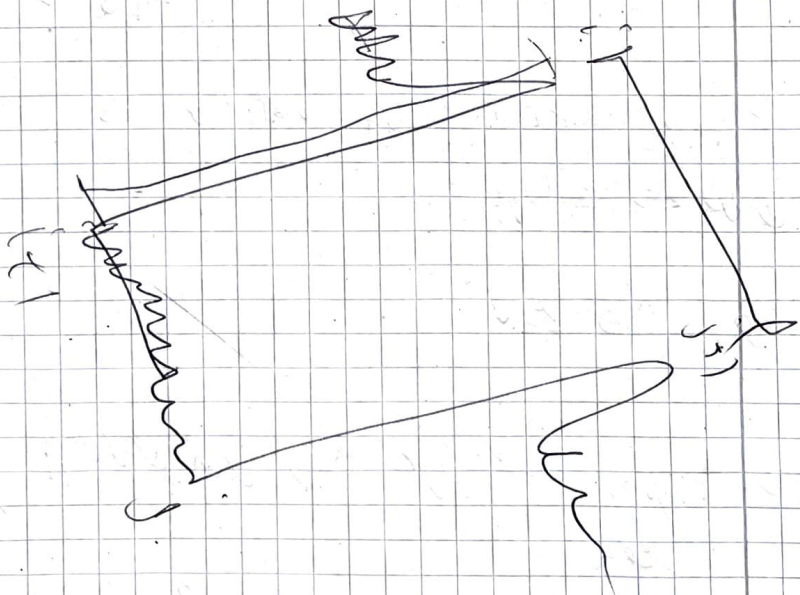
$V \rightarrow$ goes out of lock $\sim 3s - 10s$

high voltage \Rightarrow ~~unlock~~ cable movement

affects voltage measurement \Rightarrow unlock

ΔW_i
 < 0

$\Delta W_i = W_{i+1} - W_i$
 > 0



VM

Yellow $\rightarrow \delta = 46.8 \text{ mV}$

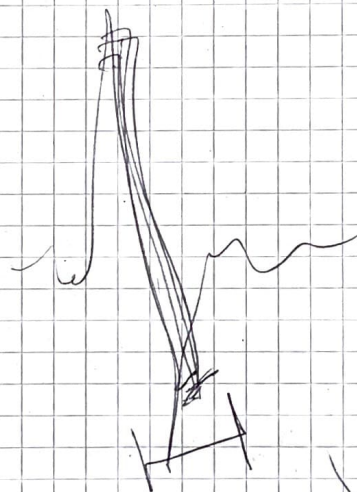
VM

green $\rightarrow 12.95 \text{ mV} = 0$

can be to
estimate
but with
(cooling time)

~~Power~~ ~~Power~~
131, 62 mA

Power?



$Q = a_{sc}$
 \uparrow
 \uparrow
size

Q

()

$(a, b, c) = \text{temp}$