

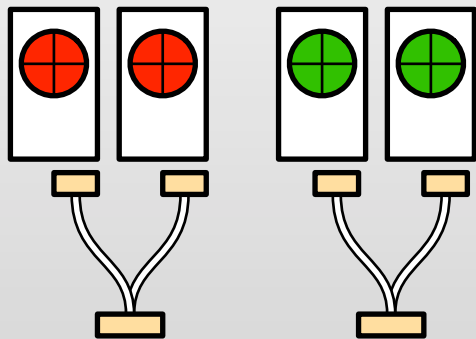
# ISC QPD Assembly - Status

Koji Arai LIGO-G1100596

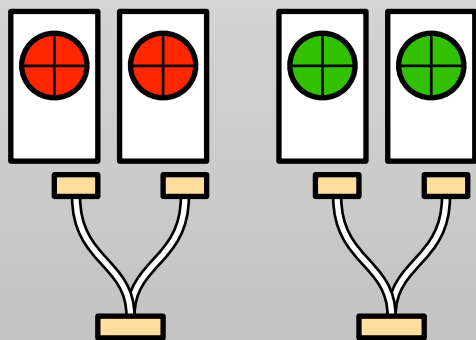
1

- Assembled for H2OAT
- ( 2 QPDs + 2 spare heads + 2 diodes ) for each color

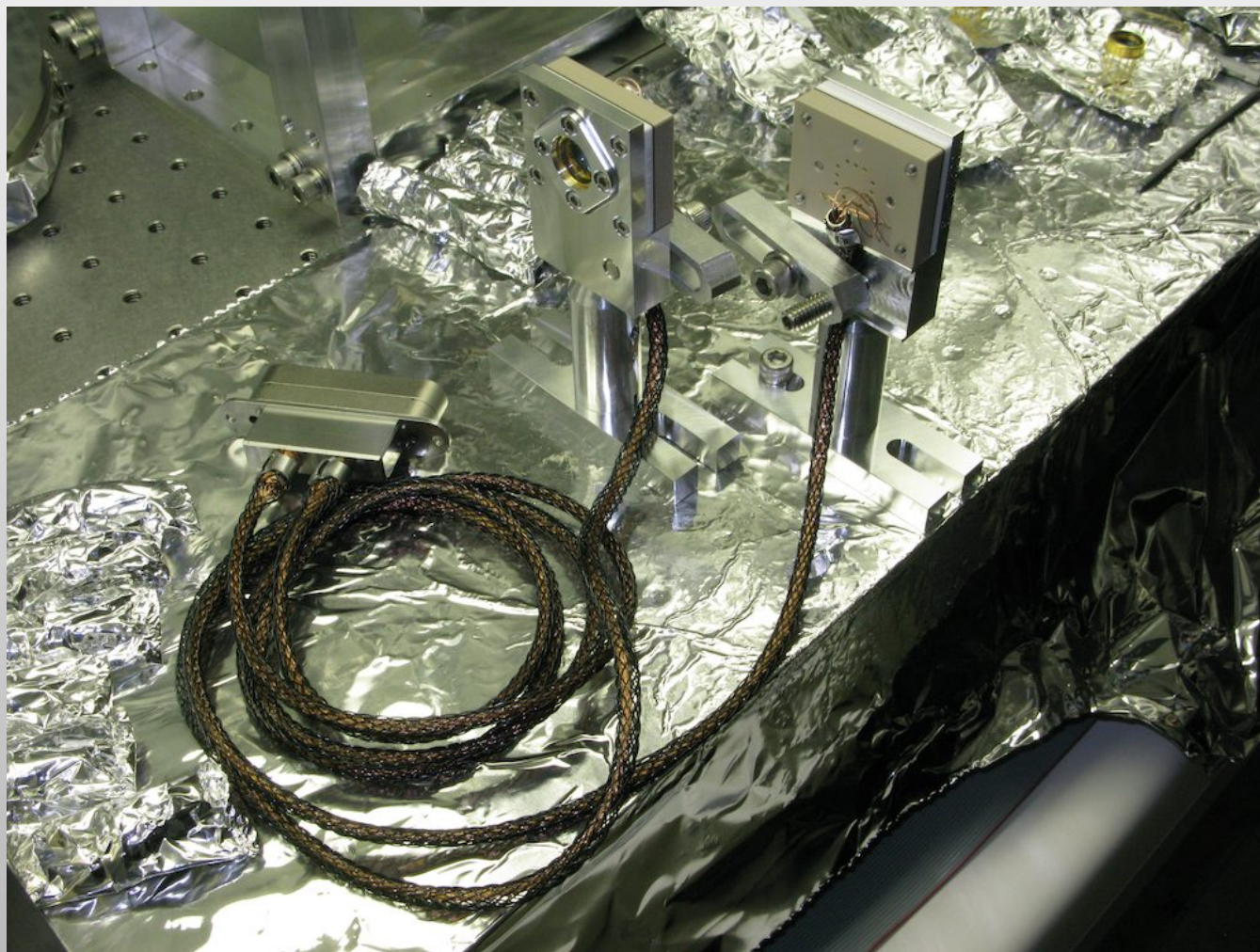
H2 TransMon - Yarm



H2 Spare

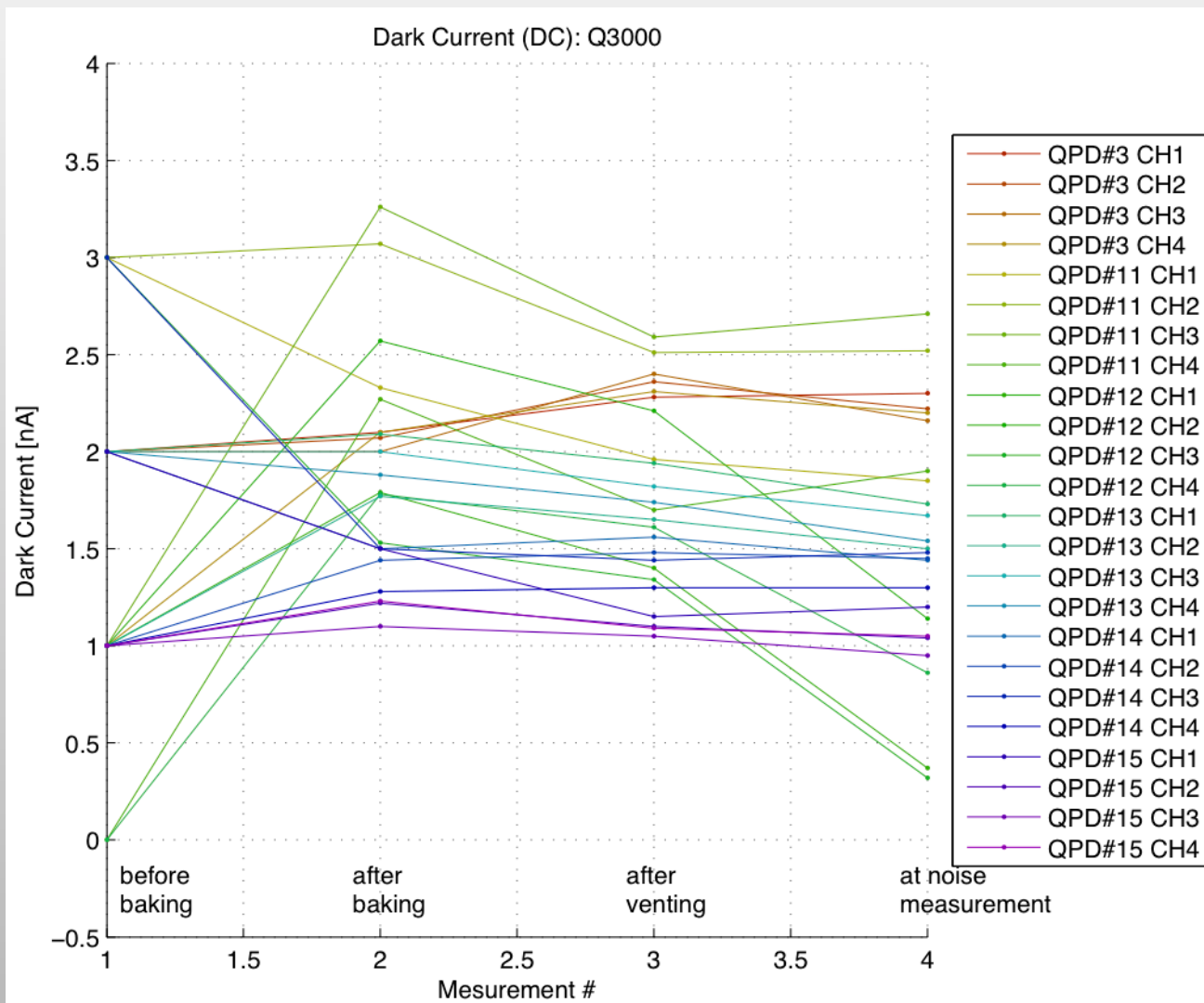


Spare diodes



# ISC QPD Assembly - Test

- Dark Current measurement at each stages of the assembly
- Q3000 (1064nm): **no significant degradation observed.**



V\_bias = 5V

Spec:

2nA typ

100nA max

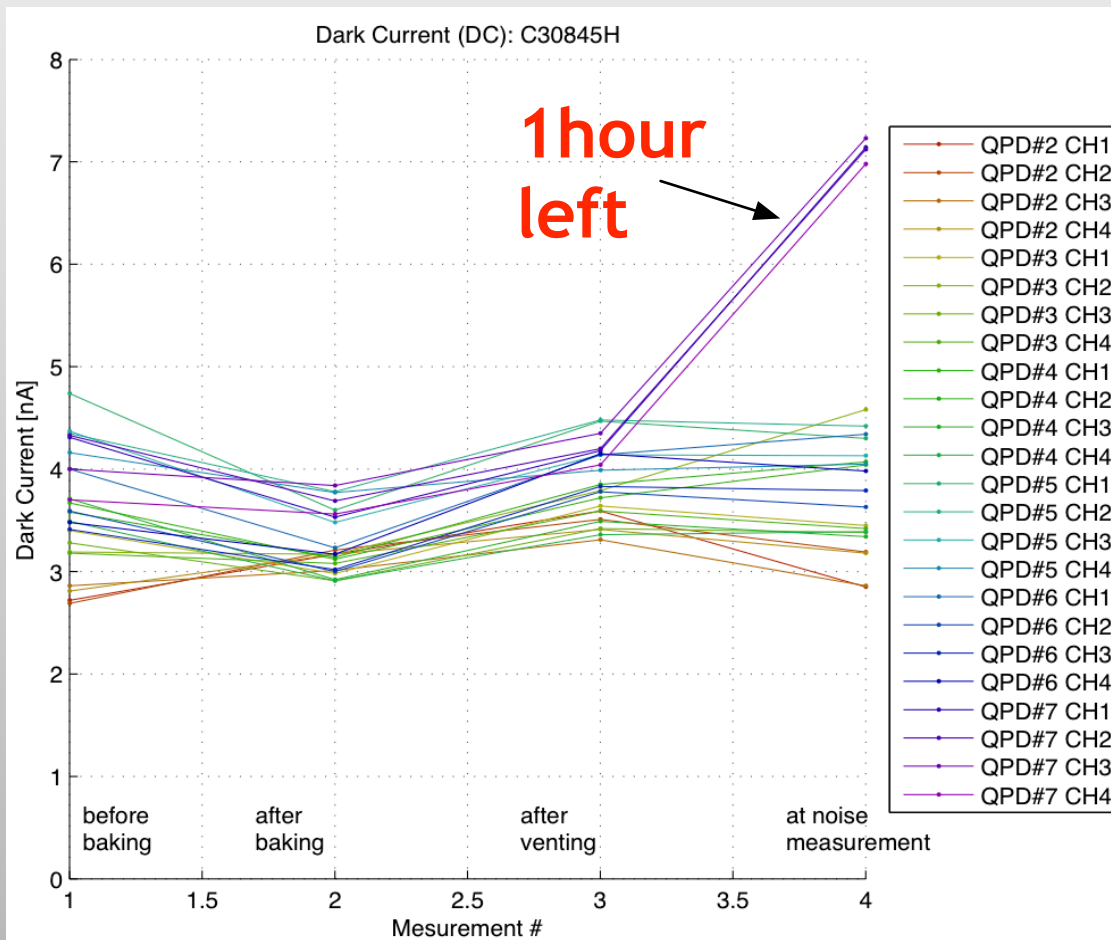
preselected

i\_dark < 4nA

# ISC QPD Assembly - Test

3

- Dark Current test for C30458H (532nm)
- Observed increasing dark current by a rate of  $\sim 0.05\text{nA}/\text{min}$ 
  - ~ after poking a vent hole
  - ~ when the reverse bias is applied



still way below  
the specification

$V_{\text{bias}} = 15\text{V}$

Spec:

$70\text{nA}_{\text{typ}}$

$200\text{nA}_{\text{typ}}$

@ $10\text{V}_{\text{bias}}$



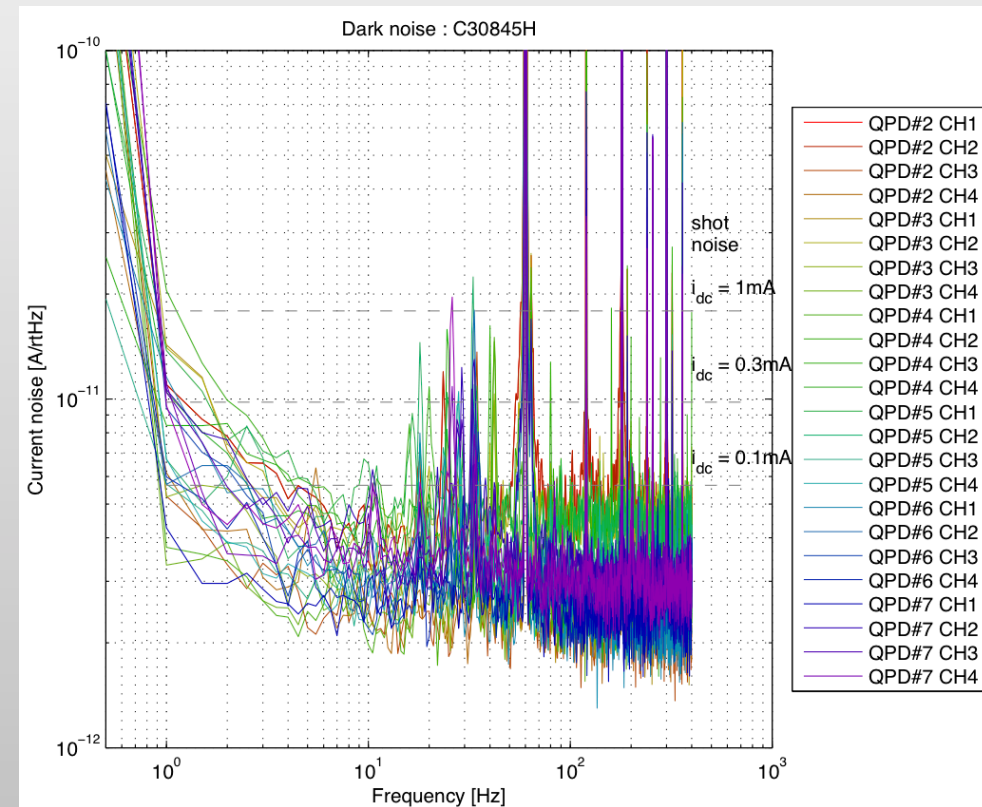
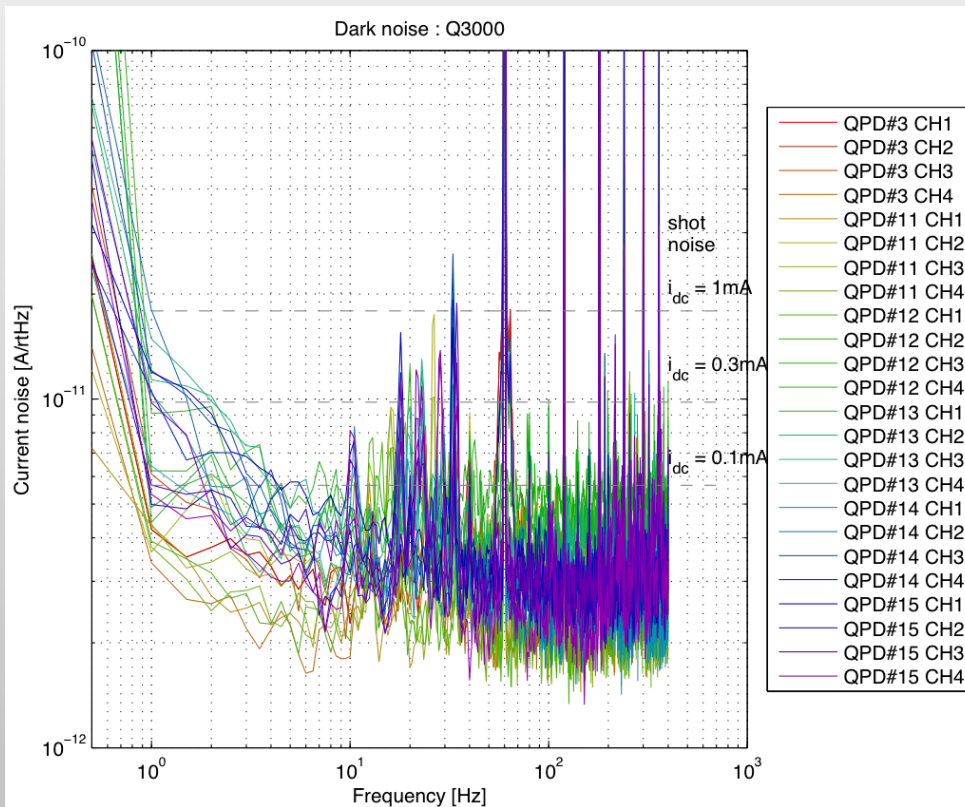
# ISC QPD Assembly - Test

4

- Dark noise measurement
- Can measure shot noise of  $i_{DC}=0.1\text{mA}$  (or better)

IR

Green



- Note: all of the elements are responding

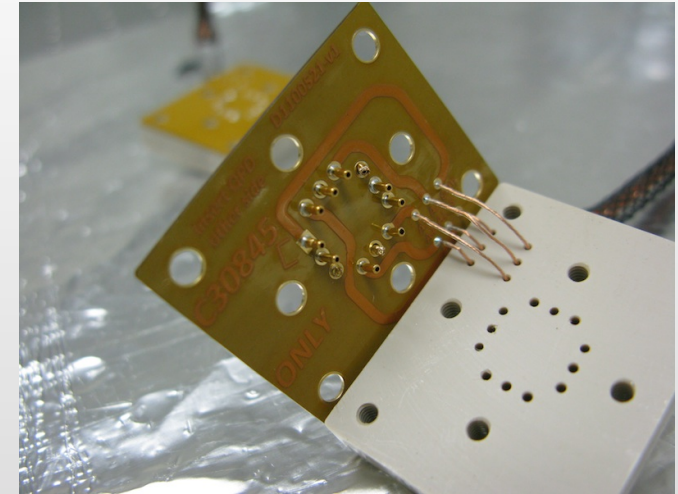
# ISC QPD Assembly - Some failures

## - Flex circuit

small misalignment of pin

=> Stress during the press fit resulted the pins popped out

=> Need alignment jig for the pin soldering & making the holes slightly bigger



## - C30845H hole poking

=> Found glass flangments inside

=> The glass lid is covering the half of the side & poking made the glass broken

=> Only one diode was spoiled. The height of the hole adjusted for the others.

