**LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY**

**-LIGO-**

**CALIFORNIA INSTITUTE OF TECHNOLOGY**

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| **TMDS Surface Charge Control Ionizer Test Procedure** |
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Performed by:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date:\_\_\_\_\_\_\_\_\_\_\_

Serial Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Overview**

TMDS Surface Charge Control Ionizer (D1400331)

1. **Test Equipment**
	1. TMDS Interface Chassis (D1500152)
	2. OR +/- 10V signal generator, 4KV Step up transformer, and 0-110 Variable Transformer
	3. Electrometer pod (D1500103)
	4. 2 Oscilloscopes
	5. Baratron Readout Box
	6. Pirani Gauge Readout Box
	7. Digital Multimeter
	8. Clean Air supply with regulator, PAL Filter and flowmeter.
2. **Preliminaries**
	1. Perform visual inspection of the system to make sure nothing looks overtly broken, and all conflats are metal-to-metal.
	2. Power up the TMDS Interface, hook up an electrometer pod, cable up the Pirani gauge, Baratron, and SHV cable to the ionizer. Tee the DVM and one oscilloscope to the “Current Mon” BNC output, and attach the other scope to the “Electrometer Monitor” BNC.
3. **Functional Test:** Set the system up to match the parameters below, and look at the electrometer output square wave on an oscilloscope. Any untrue results fails the System.
	1. **Set the Signal Generator for +/- 10V (into HiZ) square wave with a frequency of 200mHz into the “Square Wave In” BNC on the electrometer pod.**
	2. **Without opening the Norcal CSV-1502-CF Isolation Valve at the pump end, turn on the vacuum pump. With this valve closed, there should be no change in the Baratron or Pirani gauge readings. If the pressure starts going down, the valve is faulty, and should be replaced.**
	3. **Now open the NorCal valve, and adjust the air pressure and needle valve until you read a flow of 50 on the flowmeter glass (39 l/min).**
	4. **Watching the current monitor waveform, increase the high voltage until it starts to show signs of discharge, then back it off until it calms down. It should read something close to 60mV on the DVM**
	5. **Results:**

**At this flow rate the pressure read by the Baratron should be somewhere between 55 and 70 Torr.**

**Baratron Reading: Torr**

**The pressure read by the Pirani should be somewhere between 40 and 50 Torr.**

**Pirani Reading: Torr**

**If the above parameters are true, the electrometer should be reading between +3.0 to +3.7 Volts positive, and -3.2 to -3.7V negative.**

**Electrometer Reading:**

**Positive:\_\_\_\_\_\_\_\_\_**

**Negative: \_\_\_\_\_\_\_\_\_ Pass/Fail?: \_\_\_\_\_\_\_**