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IEEE 802.3cg STP Noise Test Setup

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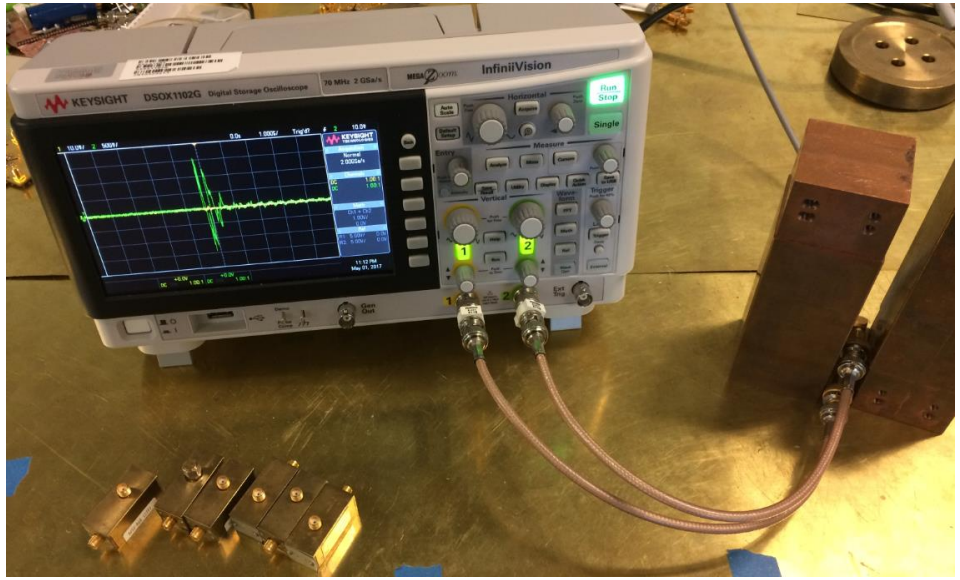
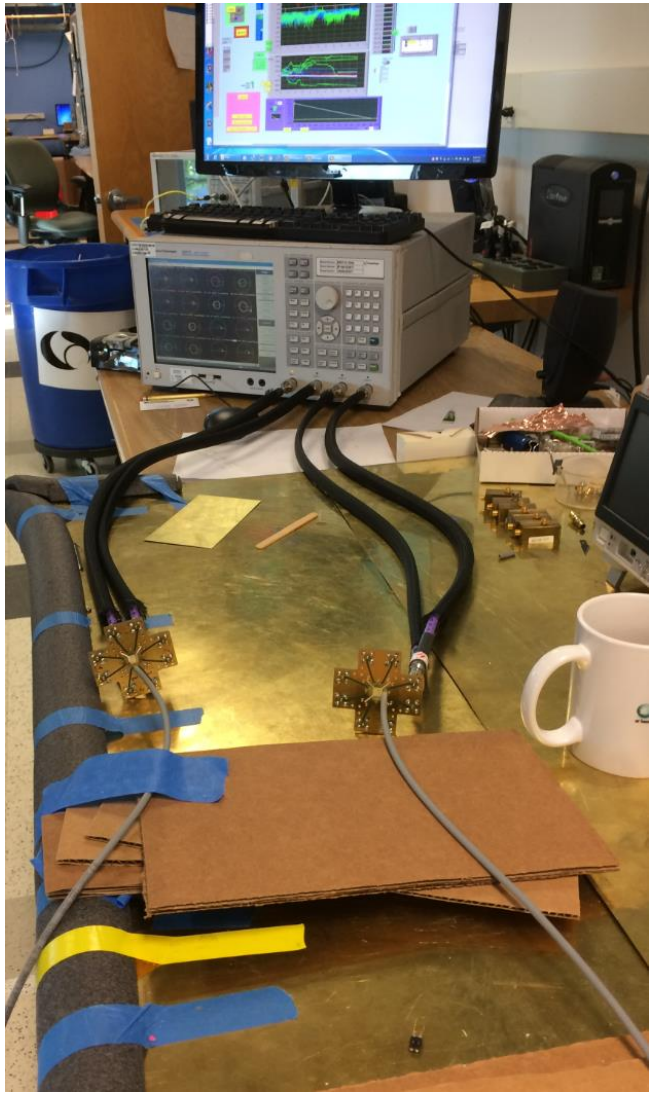
High Quality STP Cable Type For Test

This is a follow-up to the May 10 Ad Hoc presentation

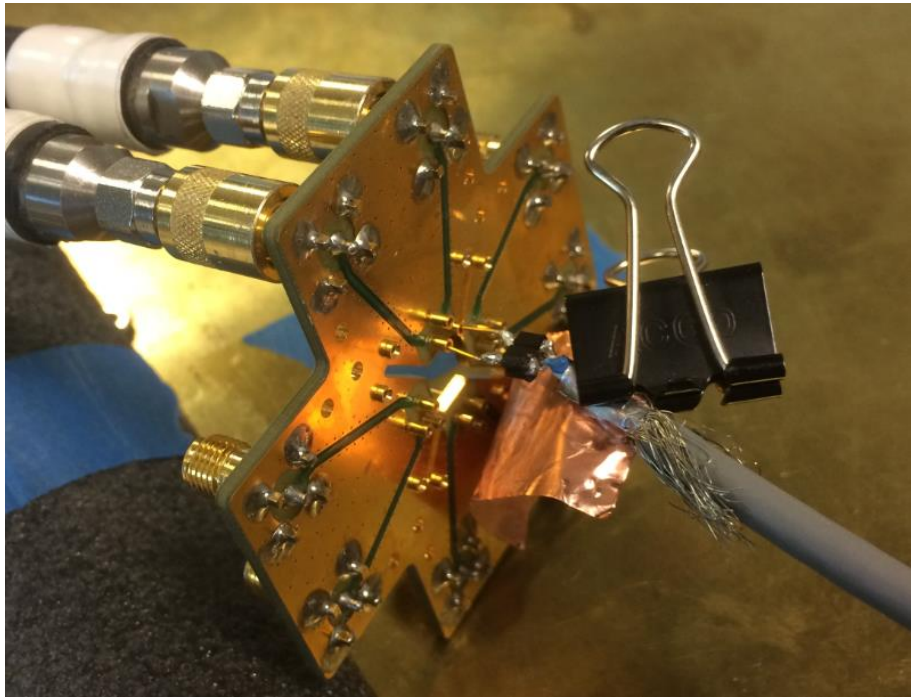
The STP cable quality and/or shield hookup were in question





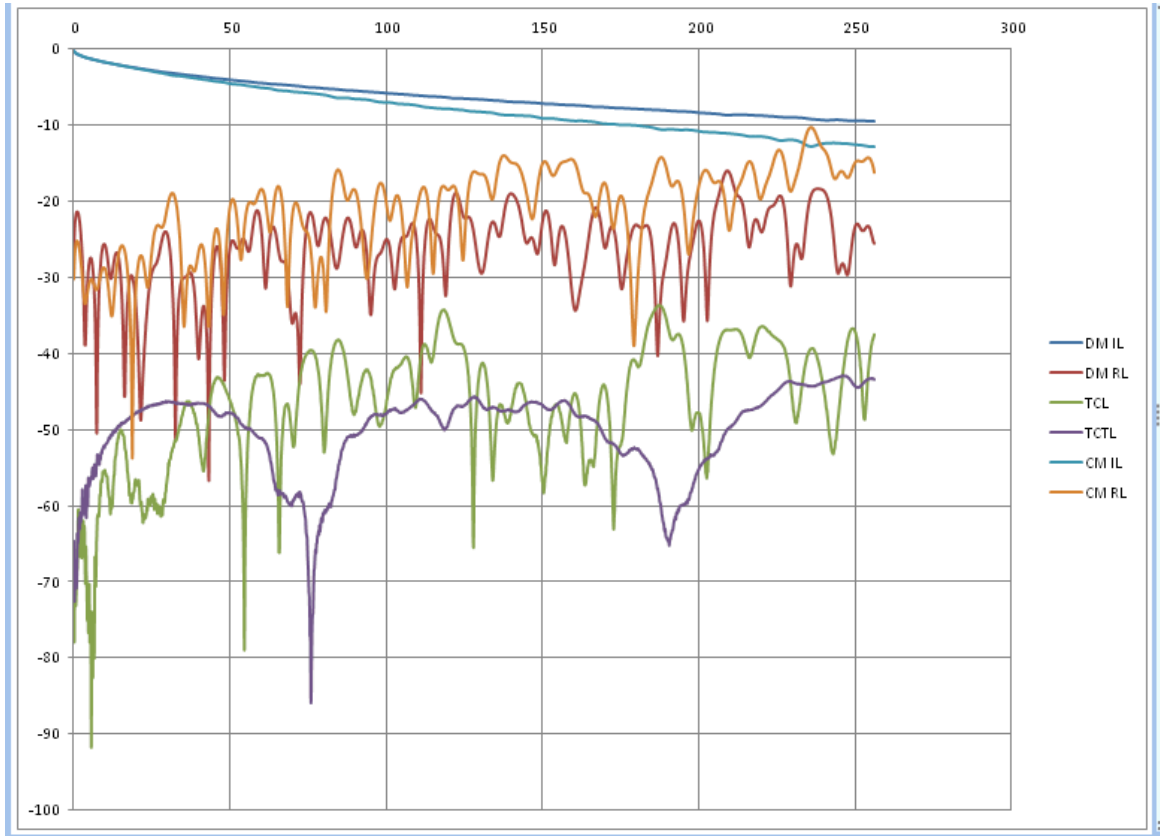
Improved Test Head Hookup

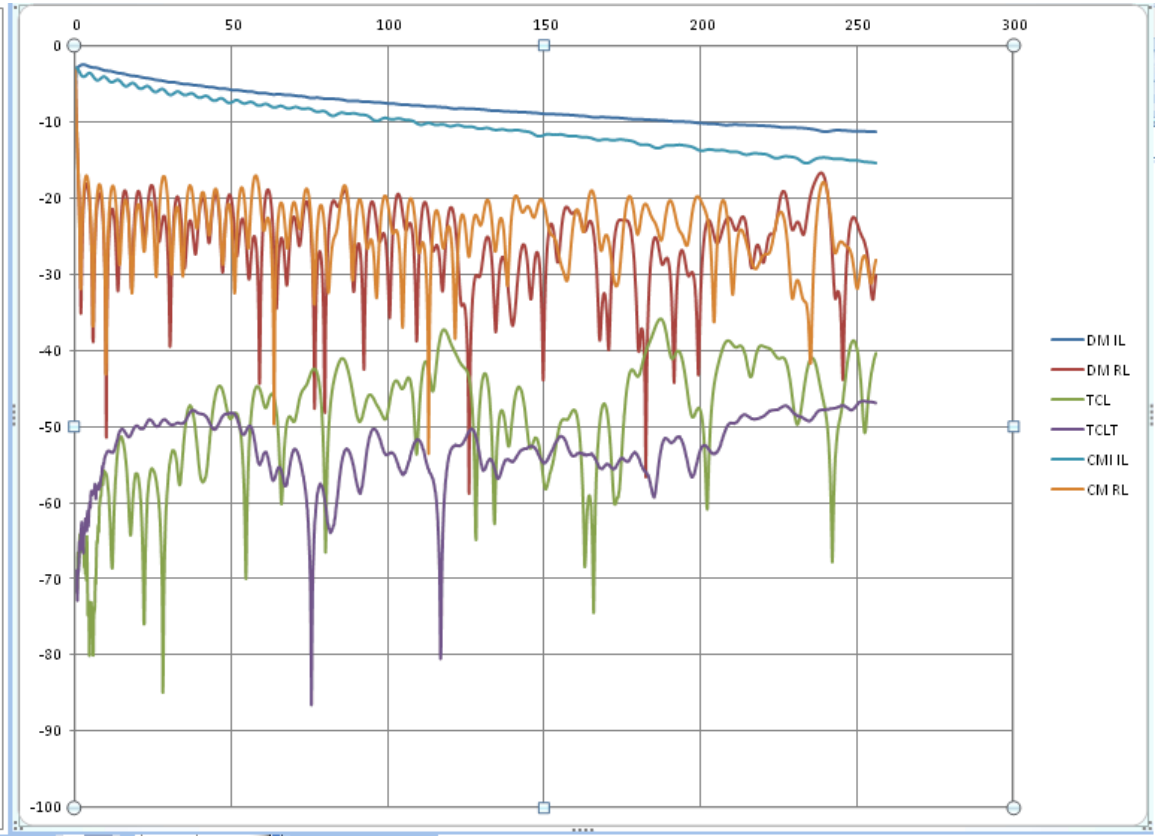
Cable test done with direct attachment to the 4 Port Network Analyzer



Shield is foil grounded directly at the Test Head but not through the BALUN third pin

Cable test done through the BH 040-0055 BALUNs





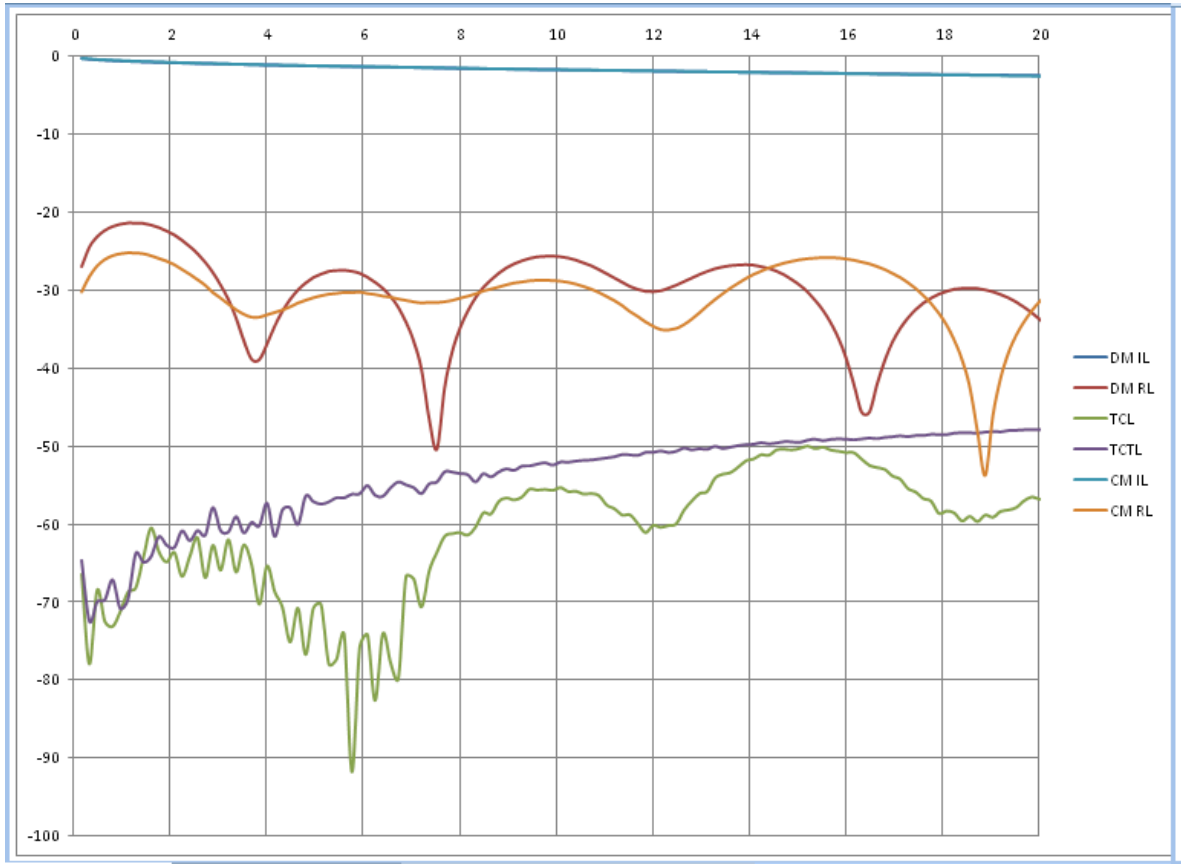
Direct NA Measurement

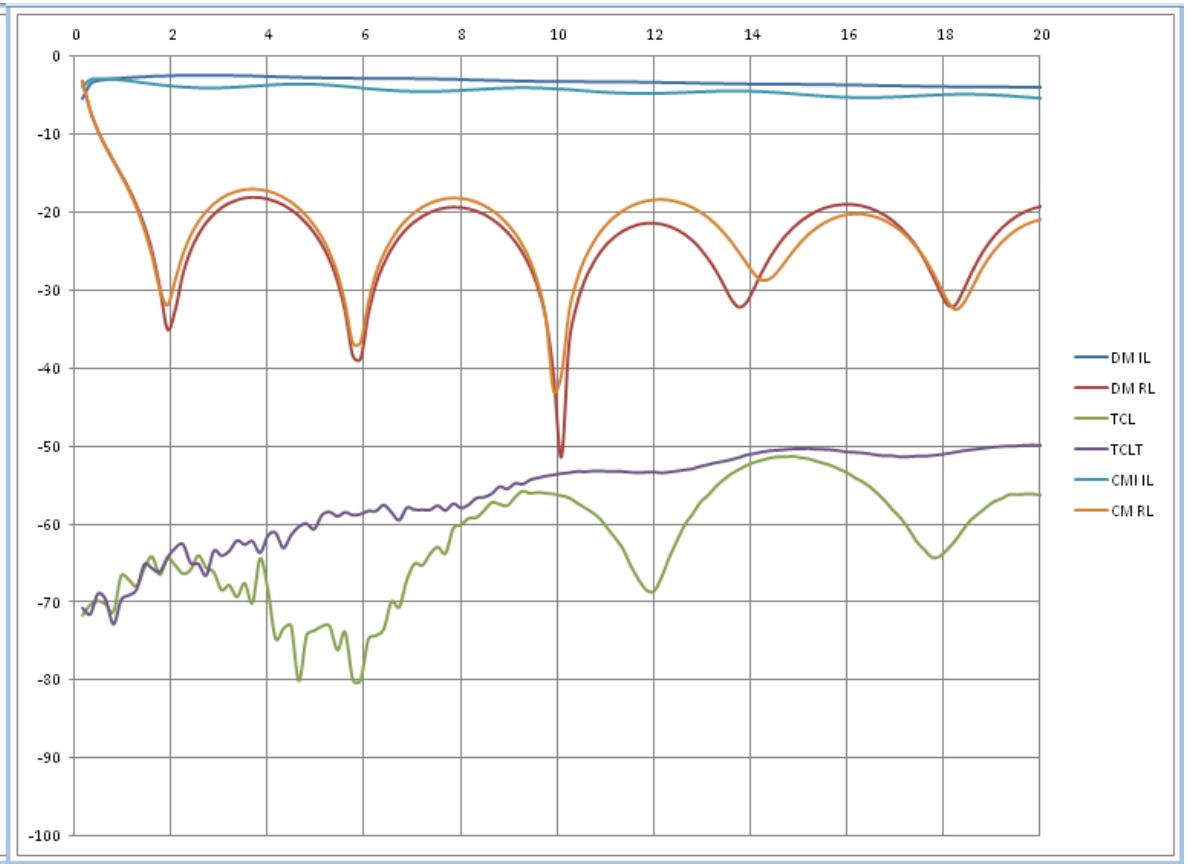
20 m cable

(38 Ω CM Impedance)

BALUN NA Measurement

Very consistent – Shows good BALUN response with small additional loss and hookup impedance





Direct Measurement

LOW FREQUENCY

BALUN Measurement

Response below 1 MHz is degraded– Perhaps not useful for AC pickup or maybe long channel noise

Impulse Noise Results

4 impulse sources tested as before:

- Static discharge
- Overhead Fluorescent
- Desk Lamp
- Desk Pencil Sharpener

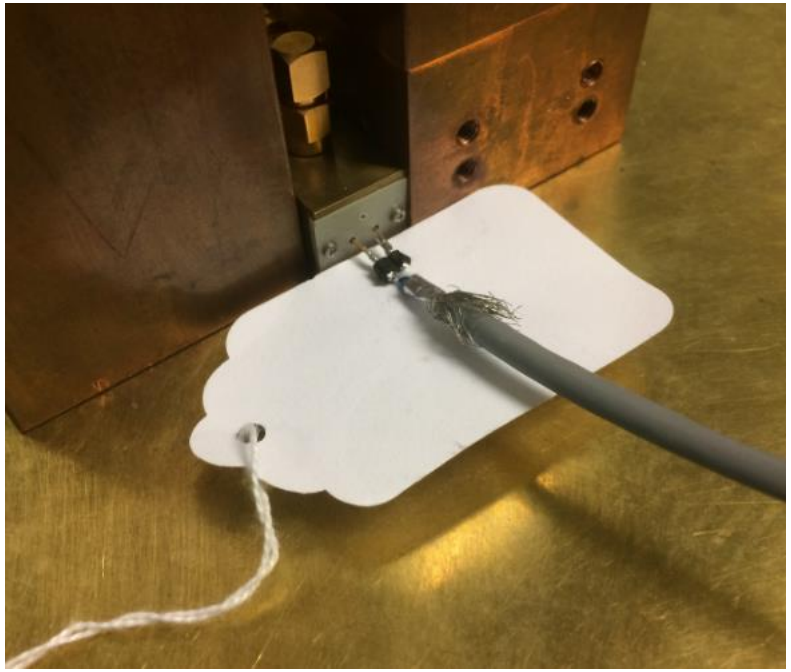
Results:

No impulses registered even with CM trigger down to 1 mV

High quality cable and correct shield termination effectively eliminate impulse pickup

So here is an experiment:

Create a **bad shield connection** (capacitive isolated with paper dielectric)

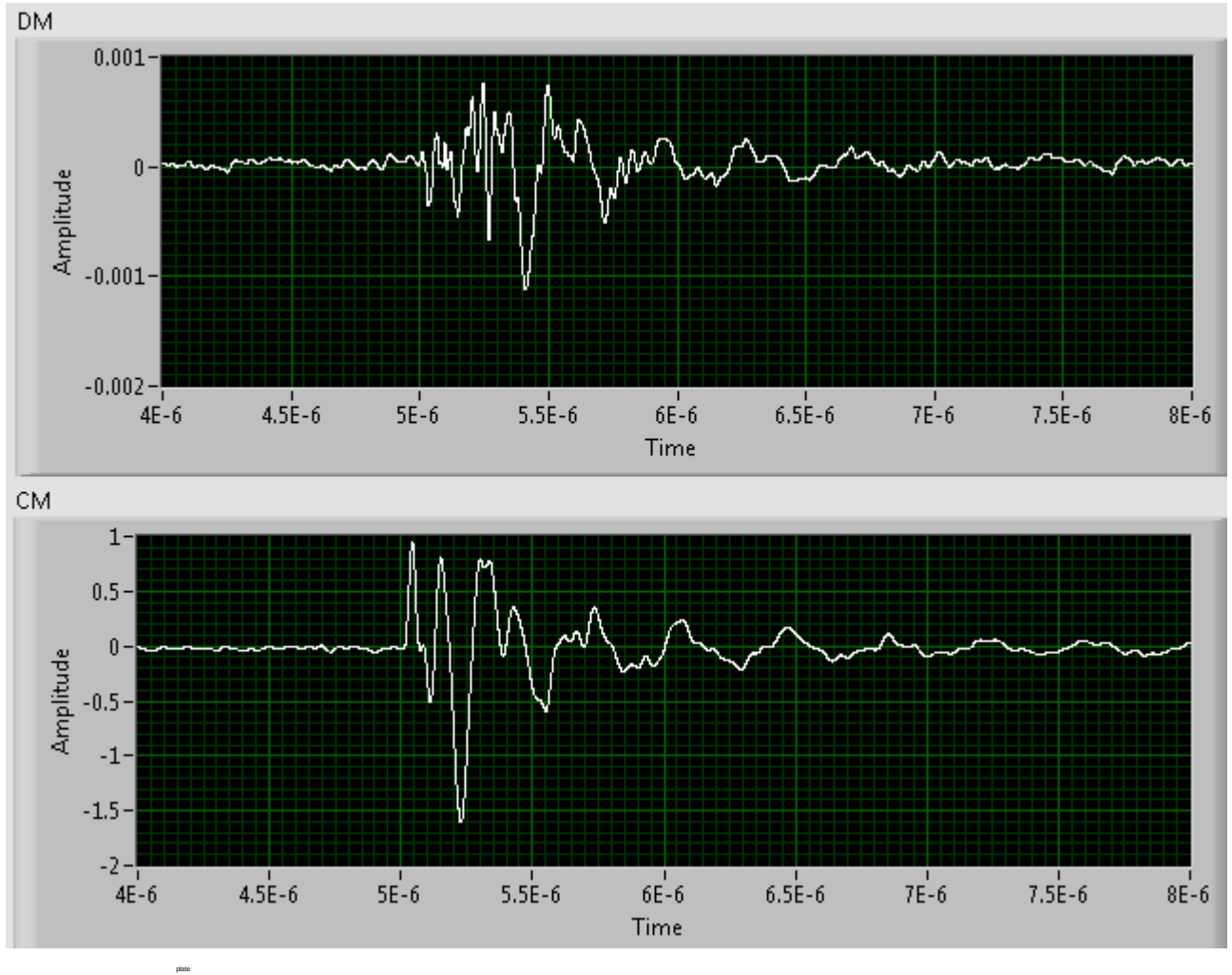


Compromised Shield Experiment

Static discharge

Now there is pickup – very similar to unshielded

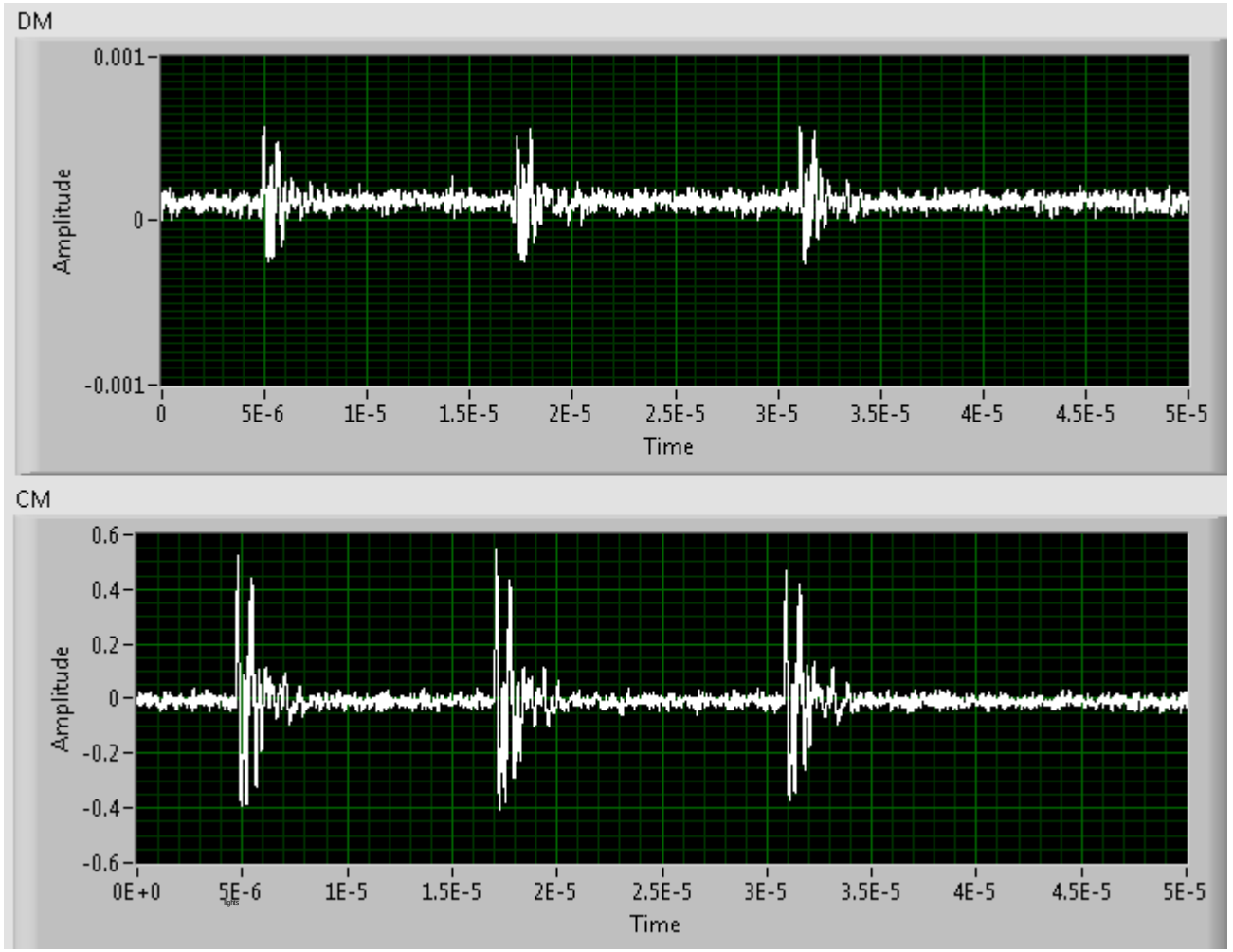
This still however shows the balance quality of the cable and test head



Compromised Shield Experiment

Overhead Fluorescent

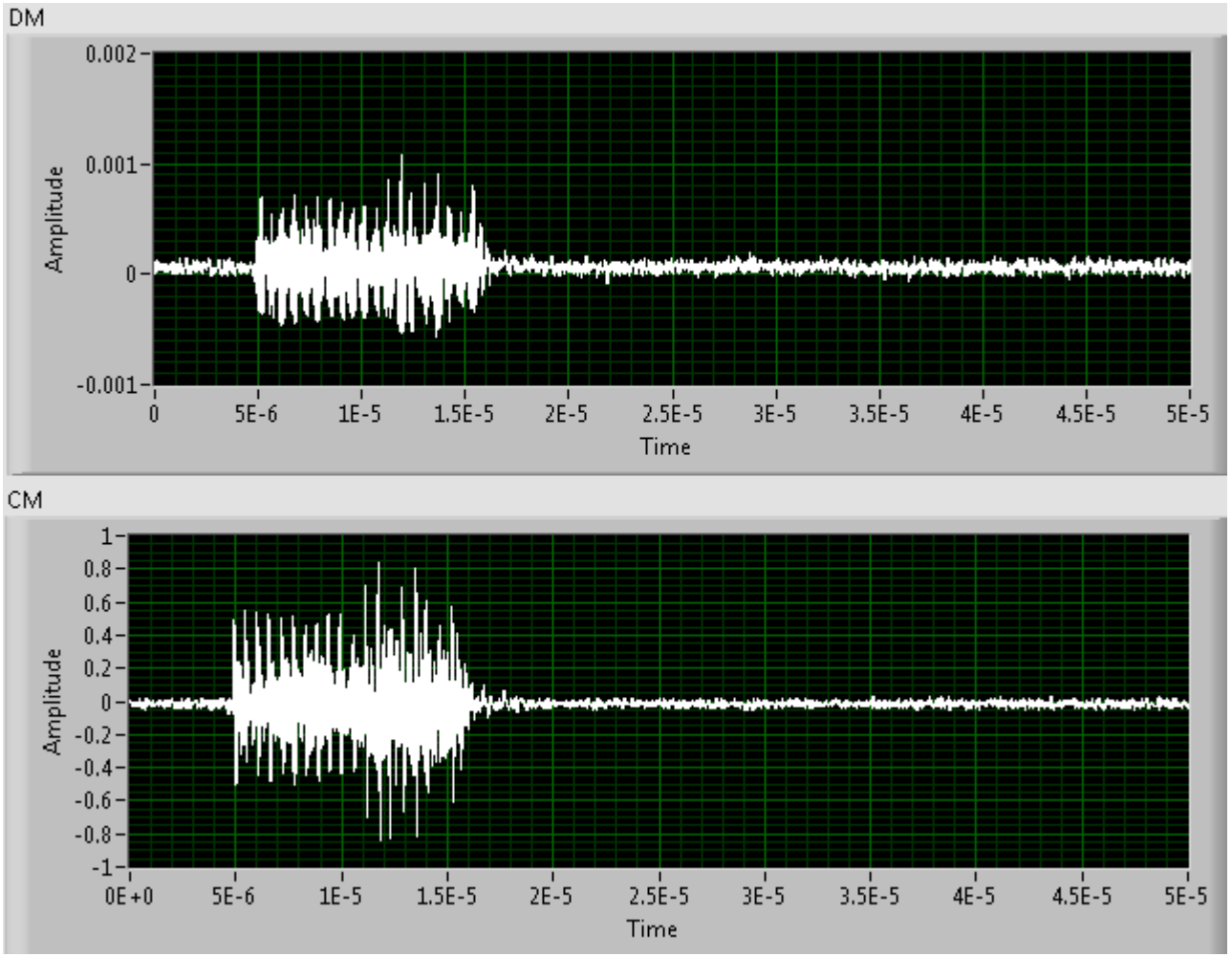
Similar to UTP



Compromised Shield Experiment

Desk Lamp

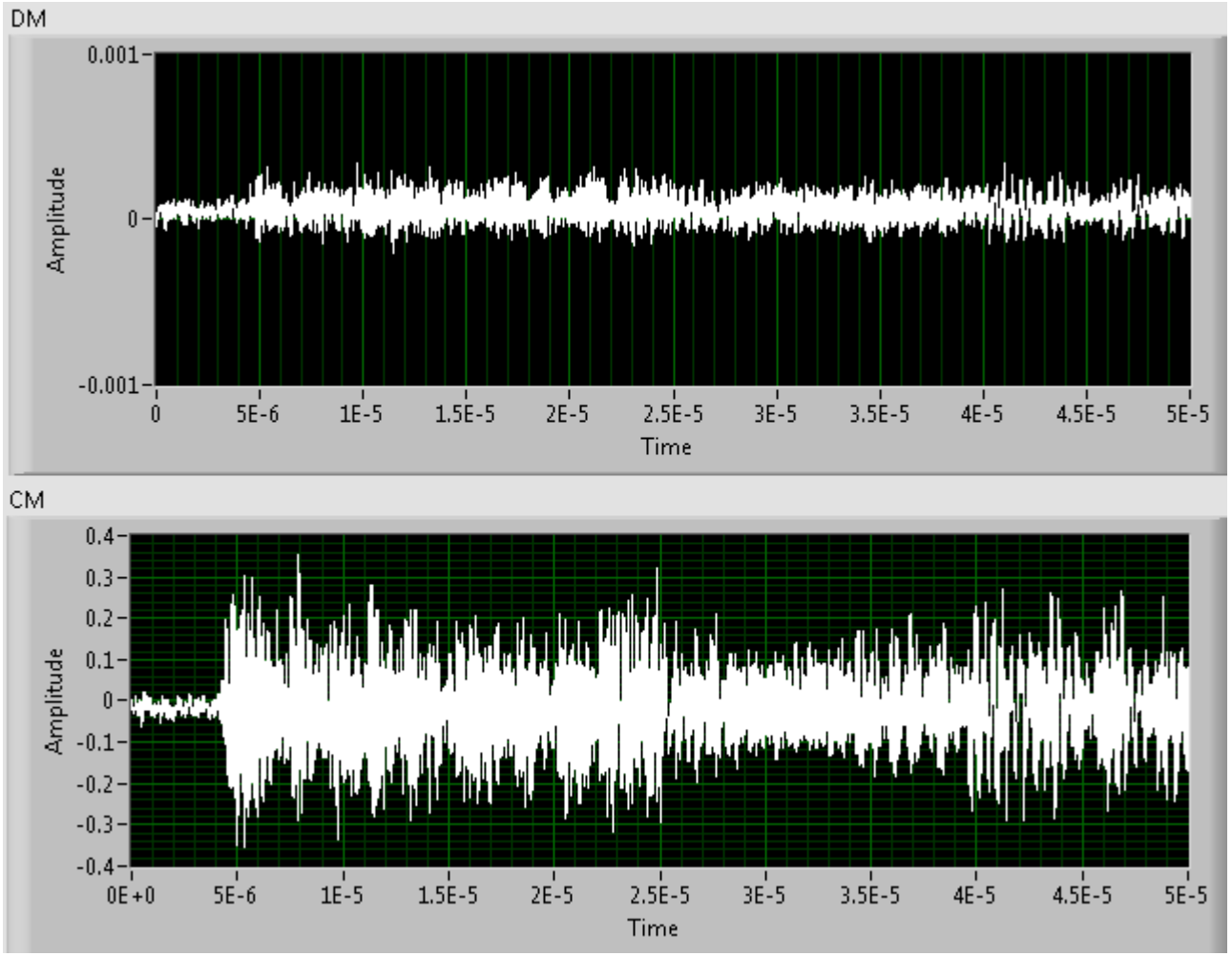
Similar to UTP



Compromised Shield Experiment

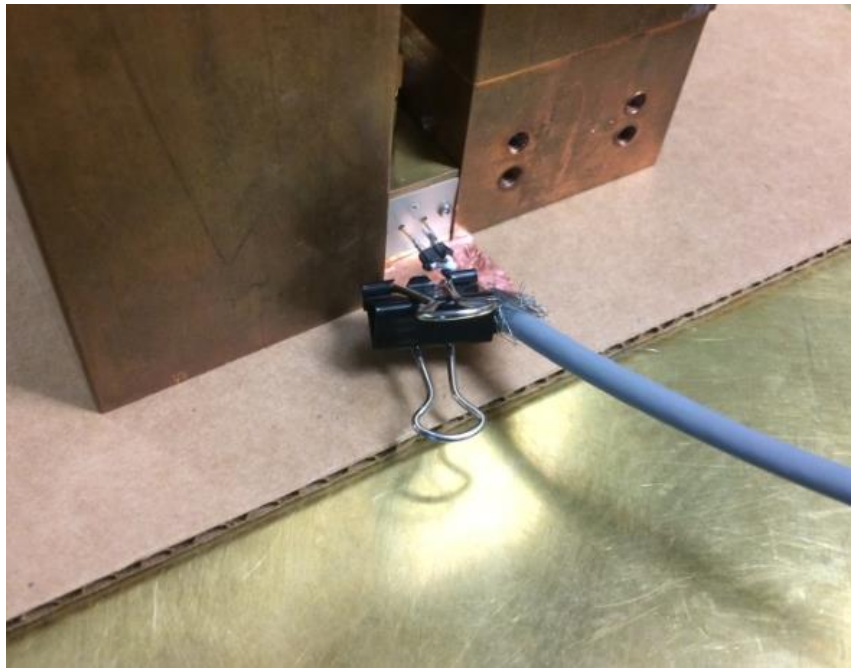
Pencil Sharpener

Similar to UTP



One More Experiment Set:

The May 10th Presentation identified an issue of the discharges being carried by the Scope ground instead of being shunted to a Test Head ground reference – Here it is confirmed that the Scope can carry the transient through its ground without trouble: **Results were the same - Compromise the shield termination and impulses leak in (but the Scope seems to work properly)**



Test Head is dielectric isolated and only connected through the Scope ground

Shield Compromised

Yet One More Experiment Set:

Check if the Scope and BALUN are actually working properly with a null experiment:

Ground out the two BALUN pins

The transients must go through the Scope ground

No impulses detected so the Scope grounding effectively handles the transient

Results

1. Verifying that a Test Head has correct properties and that the Scope properly handles transient activity through its grounding is important for achieving correct results.
   - Referencing experiments should be done to verify.

2. Shield termination can have a significant impact on results. Without effective shield termination, data and designs can be compromised.

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Thank You

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