# First Tests of Radiation Hardness & Serial Test Setup

Werner Erni, Michael Steinacher, *Irakli Keshelashvili*

Group of Prof. Bernd Krusche

University of Basel

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# Irradiation Protocol - $^{60}$Co source

JUSTUS-LIEBIG-
UNIVERSITÄT
GIESSEN

FACHBEREICH 07
Mathematik
und Informatik,
Physik, Geographie

II. Physikalisches Institut • Heinrich-Buff-Ring 16 • D-35392 Gießen

II. Physikalisches Institut

Till Kuske
Heinrich-Buff-Ring 16
D-35392 Gießen
Tel.: 0641 / 99 – 3 32 72
Fax.: 0641 / 99 – 3 32 09
Email: till.kuske@exp2.physik.uni-giessen.de
Az.:

25.02.2014

Universität Basel
z.Hd. Werner Erni

**Rücksendung der bestrahlten Elektronik**

Hallo Werner,

wie gefordert haben wir die Elektronik im Strahlenzentrum mit Cobalt Quellen bestrahlt.

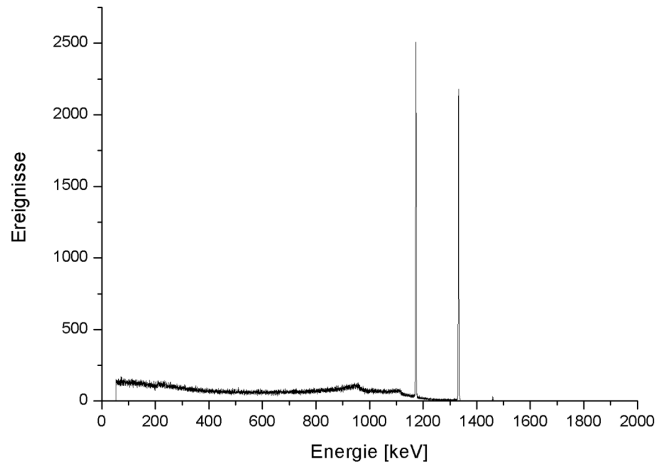
Das aktive Bauteil hat eine Strahlungsdosis äquivalent zu 30kGy abbekommen (verglichen mit unserer Bestrahlung von PWO-II) und lief die ganze Zeit ohne Anstieg des Stroms oder der Temperatur.

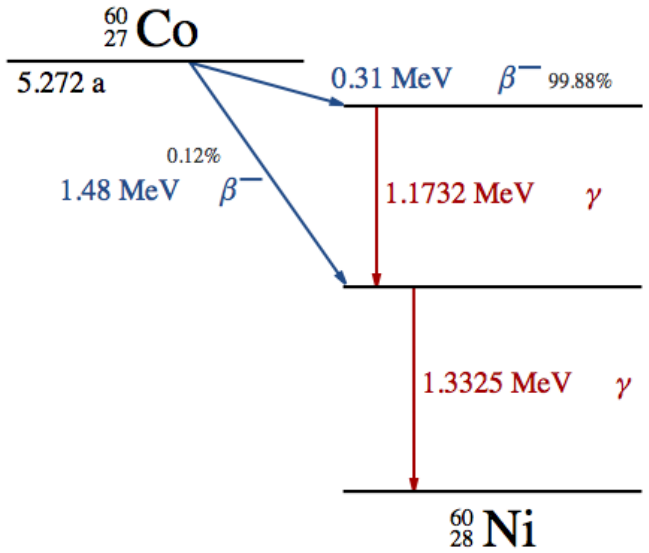
Die nicht aktive Elektronik hat eine Gesamtdosis von 8kGy abbekommen (verglichen mit unserer Bestrahlung von PWO-II).

Die Dosisangaben beziehen sich immer auf das, was PWO absorbiert hätte. Die Elektronik absorbiert natürlich deutlich weniger und so ist die Dosisangabe immer auf die Umgebung zu beziehen.

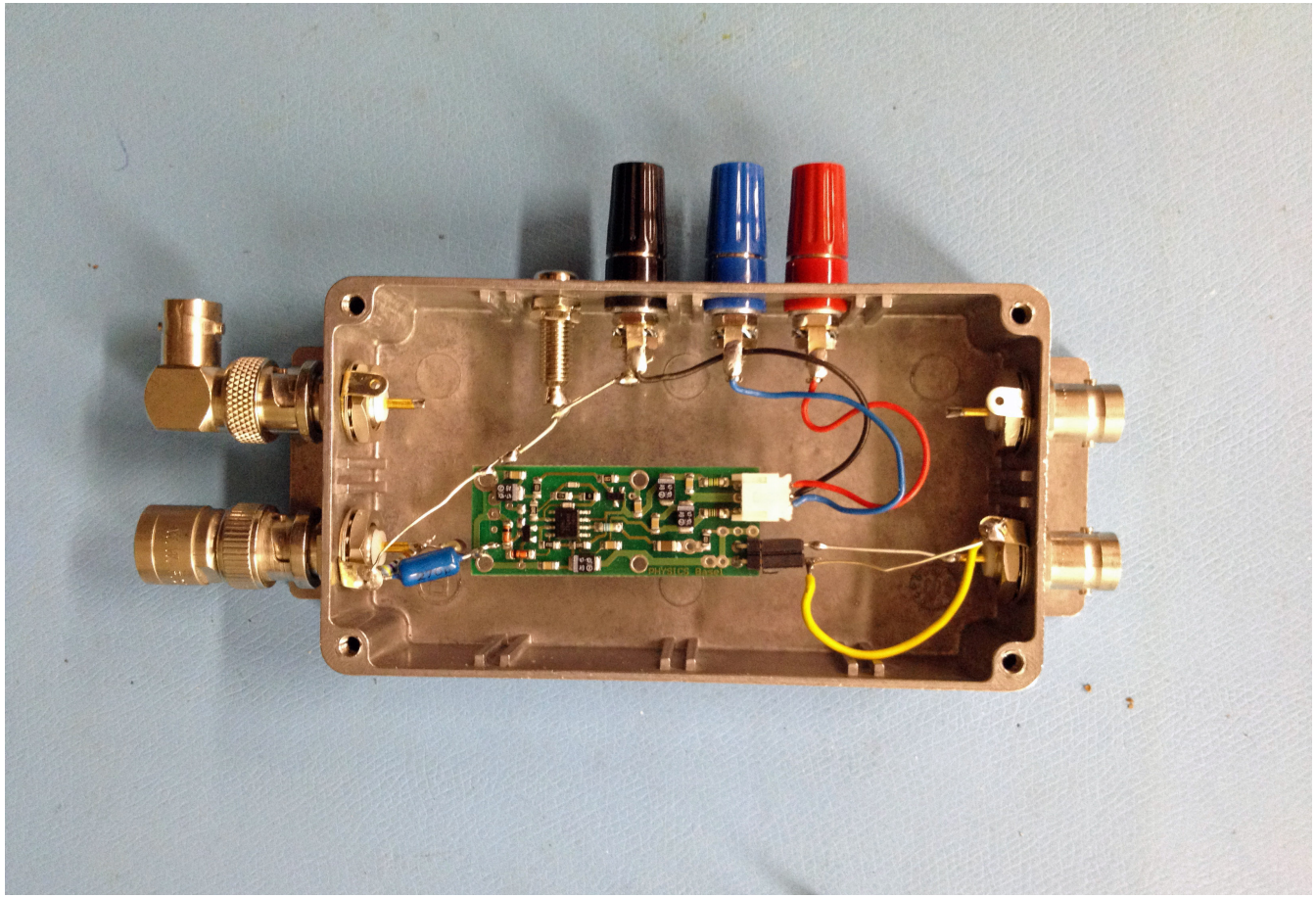
Mit freundlichen Grüßen,

Till Kuske



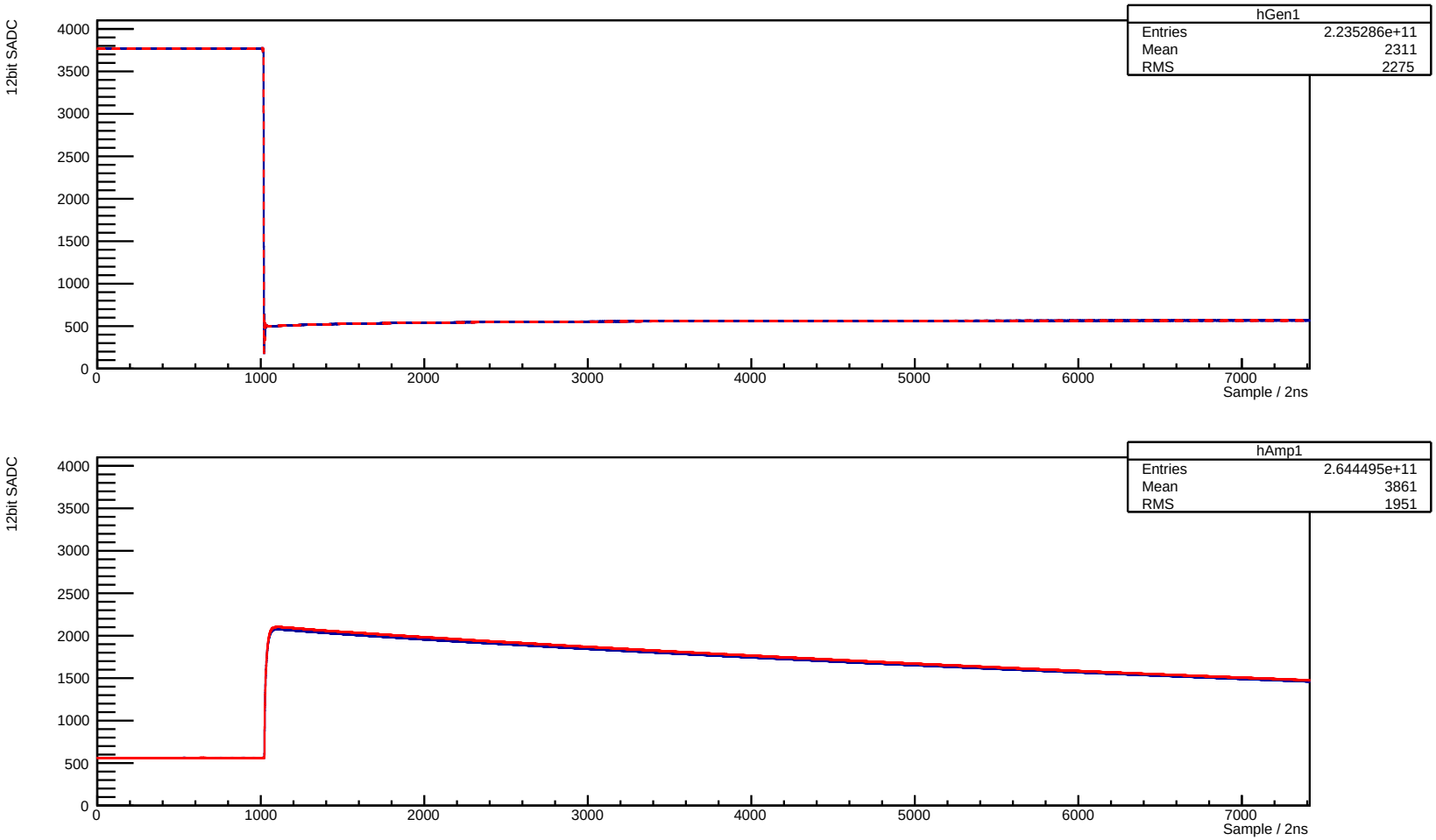



# Basel LNP PreAmp inside the Testbox



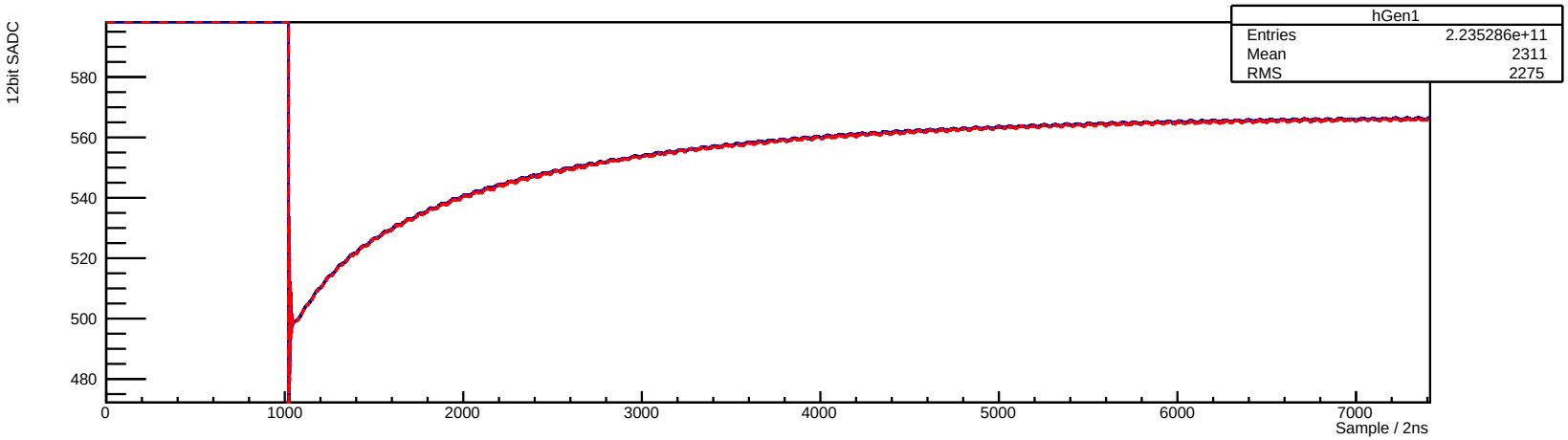
# Before and after iradiation of LNP, SN 284

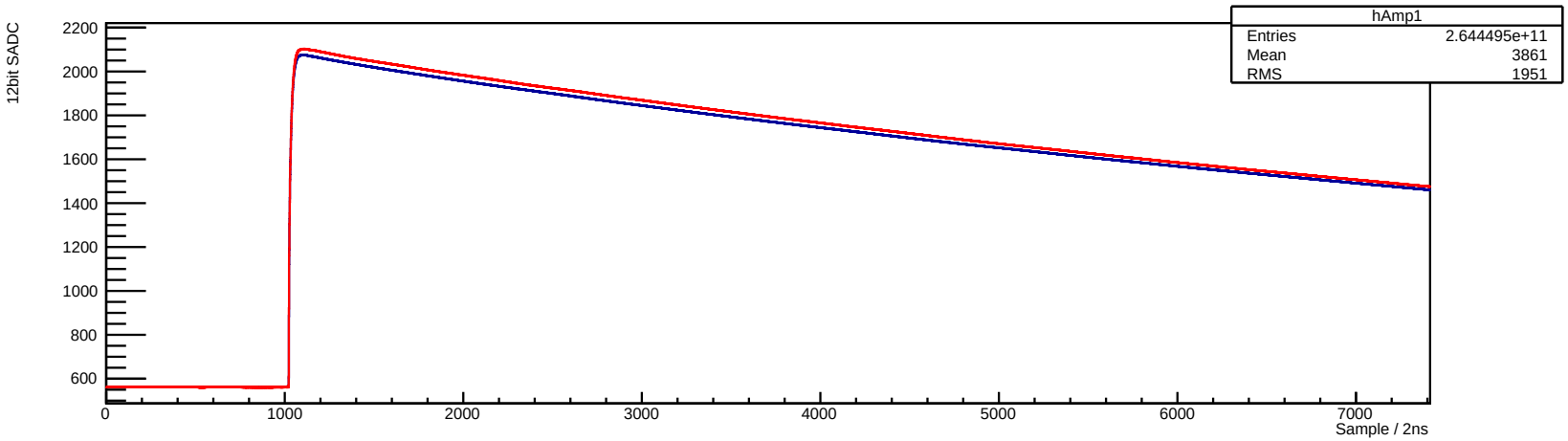
## Irradiaton of "7 kGy"; –before –after



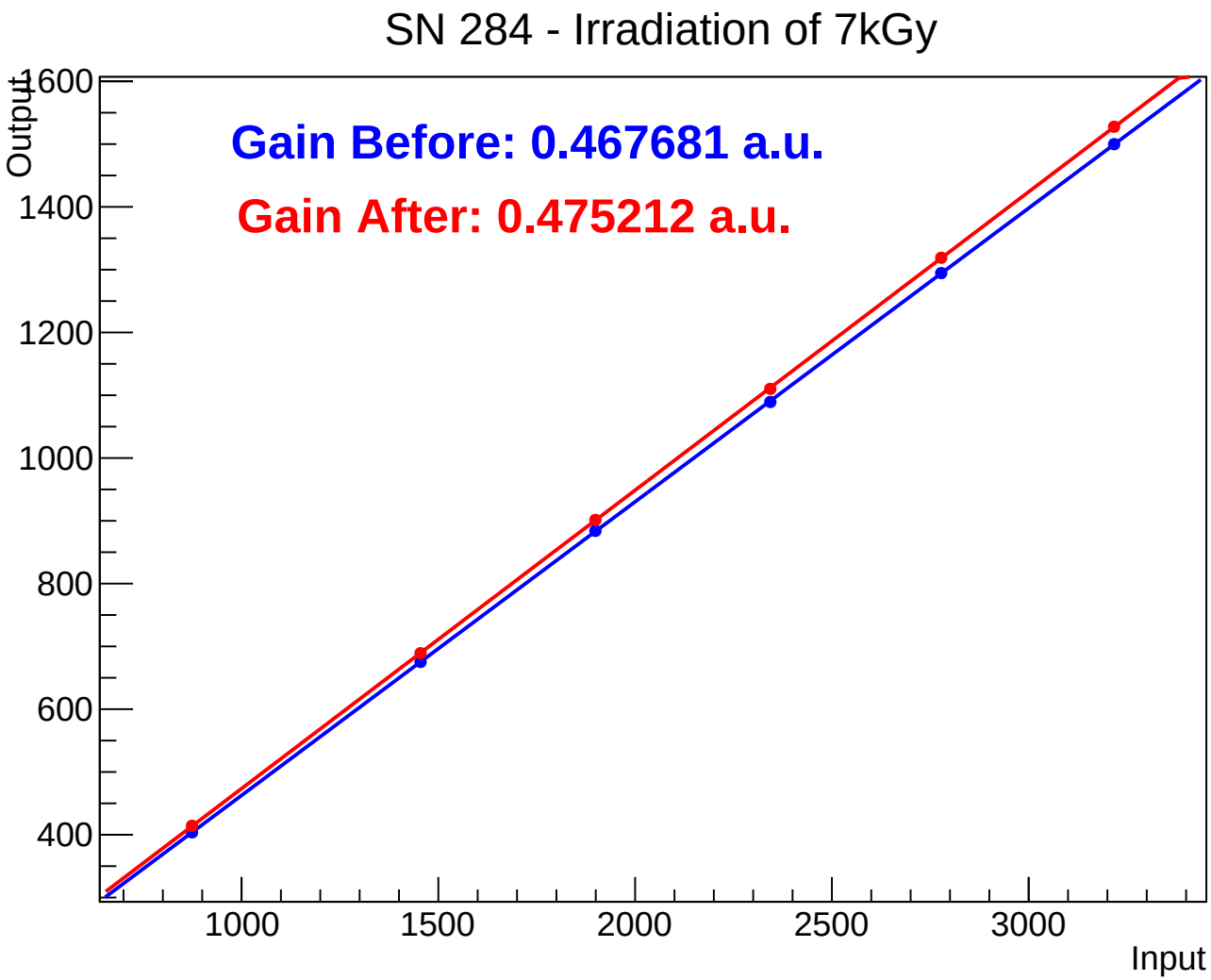
# Zoom - Before and after iradiation of LNP, SN 284

## Irradiaton of "7 kGy"; –before –after



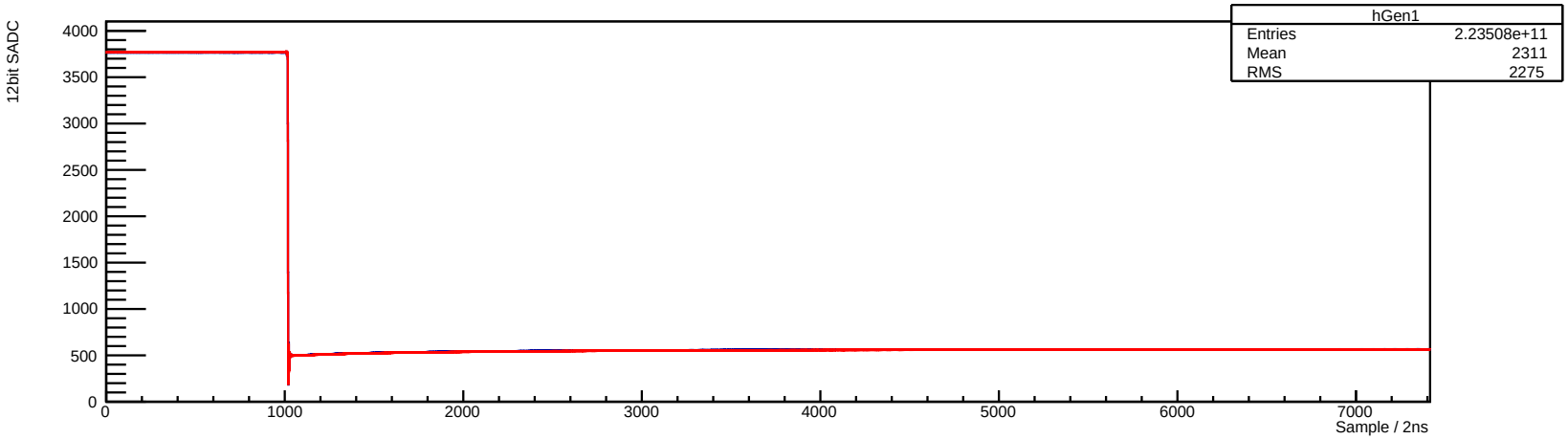



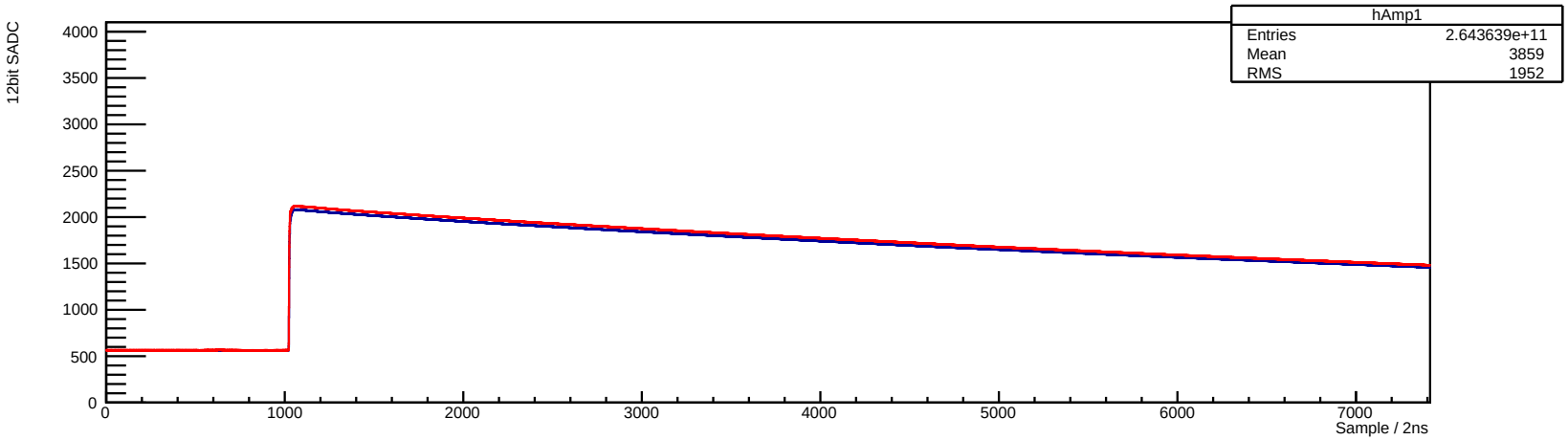
# Gain Change: 1.6%, SN 284



# Before and after iradiation of LNP, SN 283

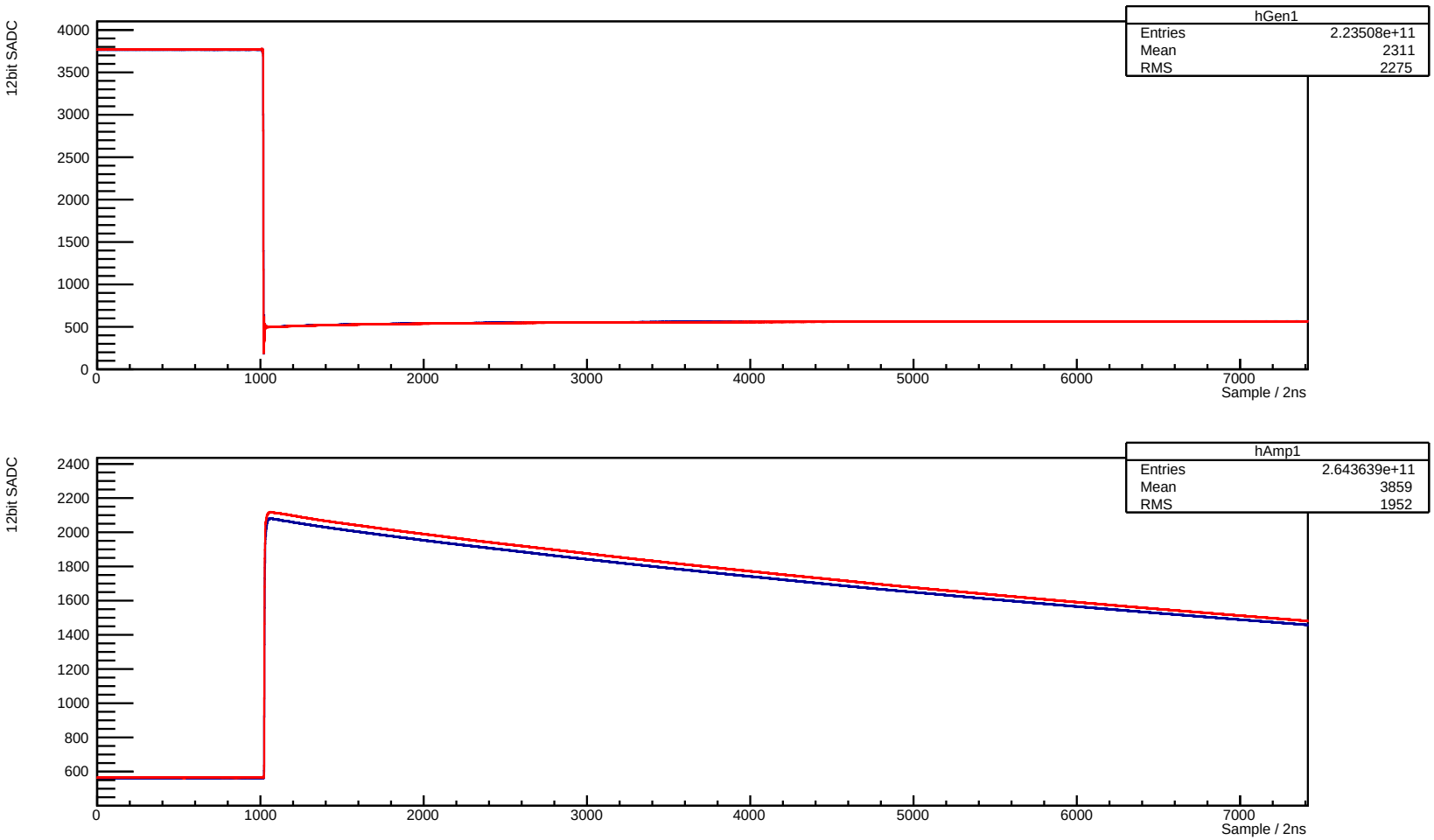
## Irradiaton of "30 kGy" and Power ON (± 6V); –before –after



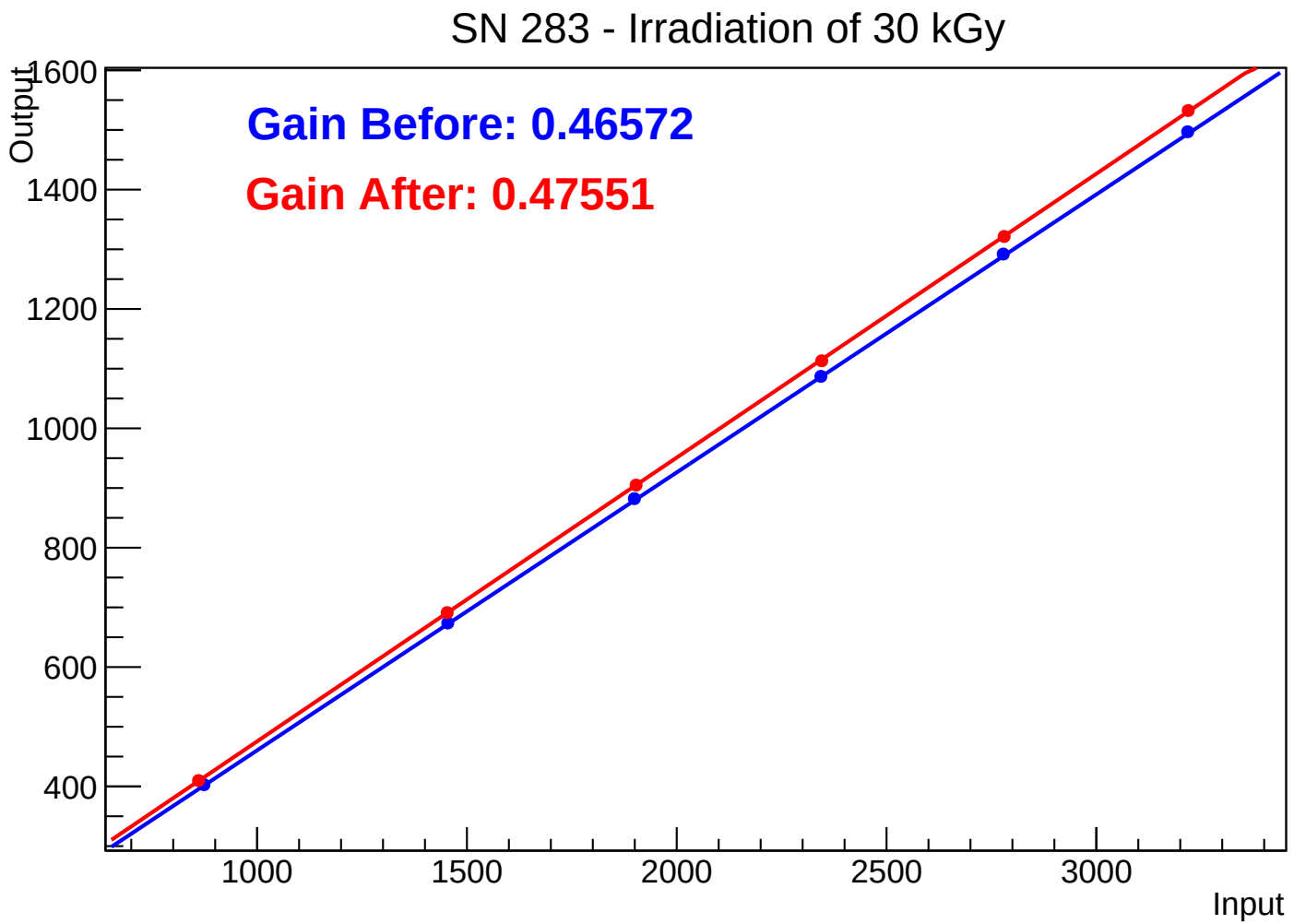



# Zoom - Before and after iradiation of LNP, SN 283

## Irradiaton of "30 kGy" and Power ON (± 6V); –before –after



# Gain Change: 2.1%, SN 283



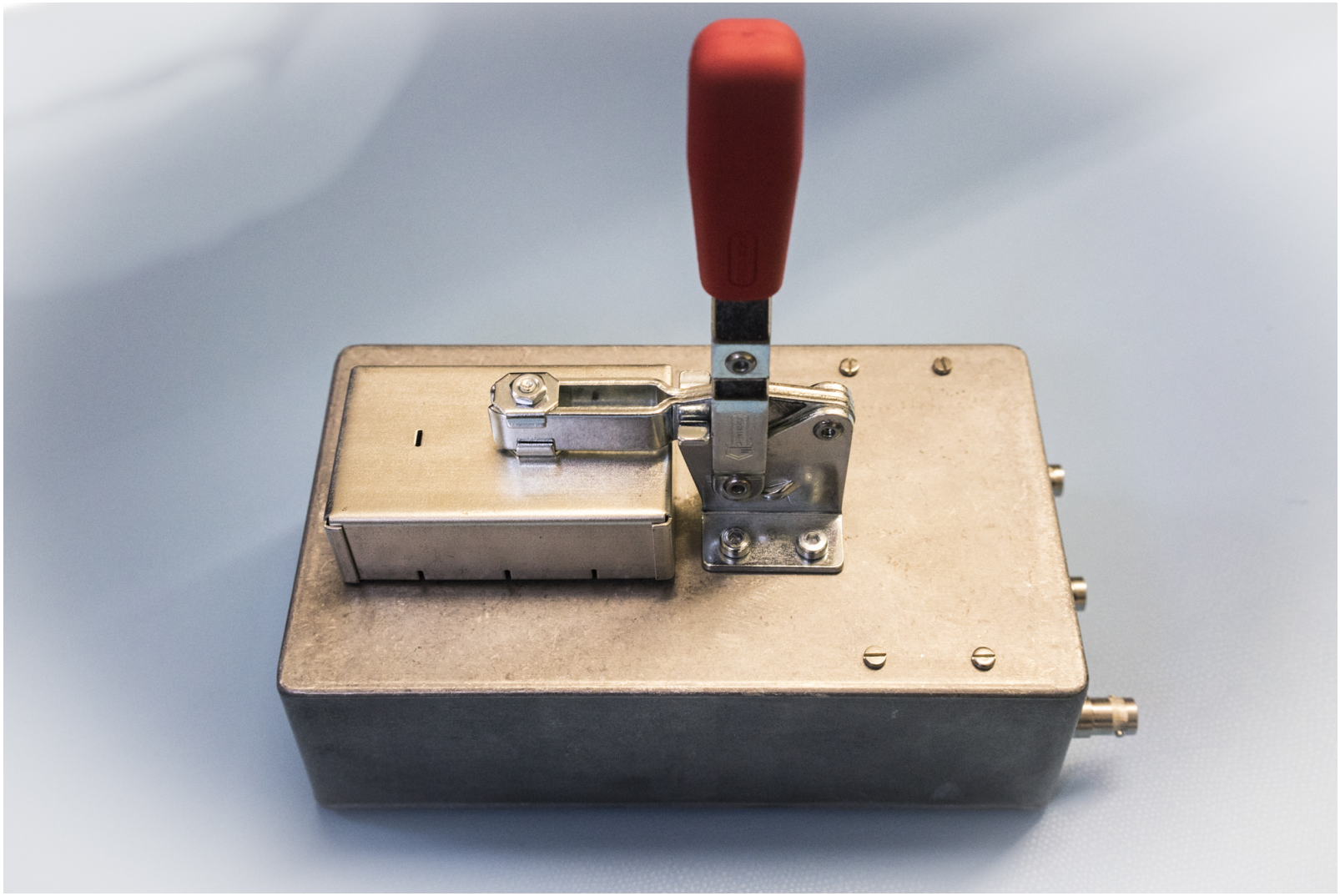
# Power Consumption

After irradiaton current is decreased for both PreAmps

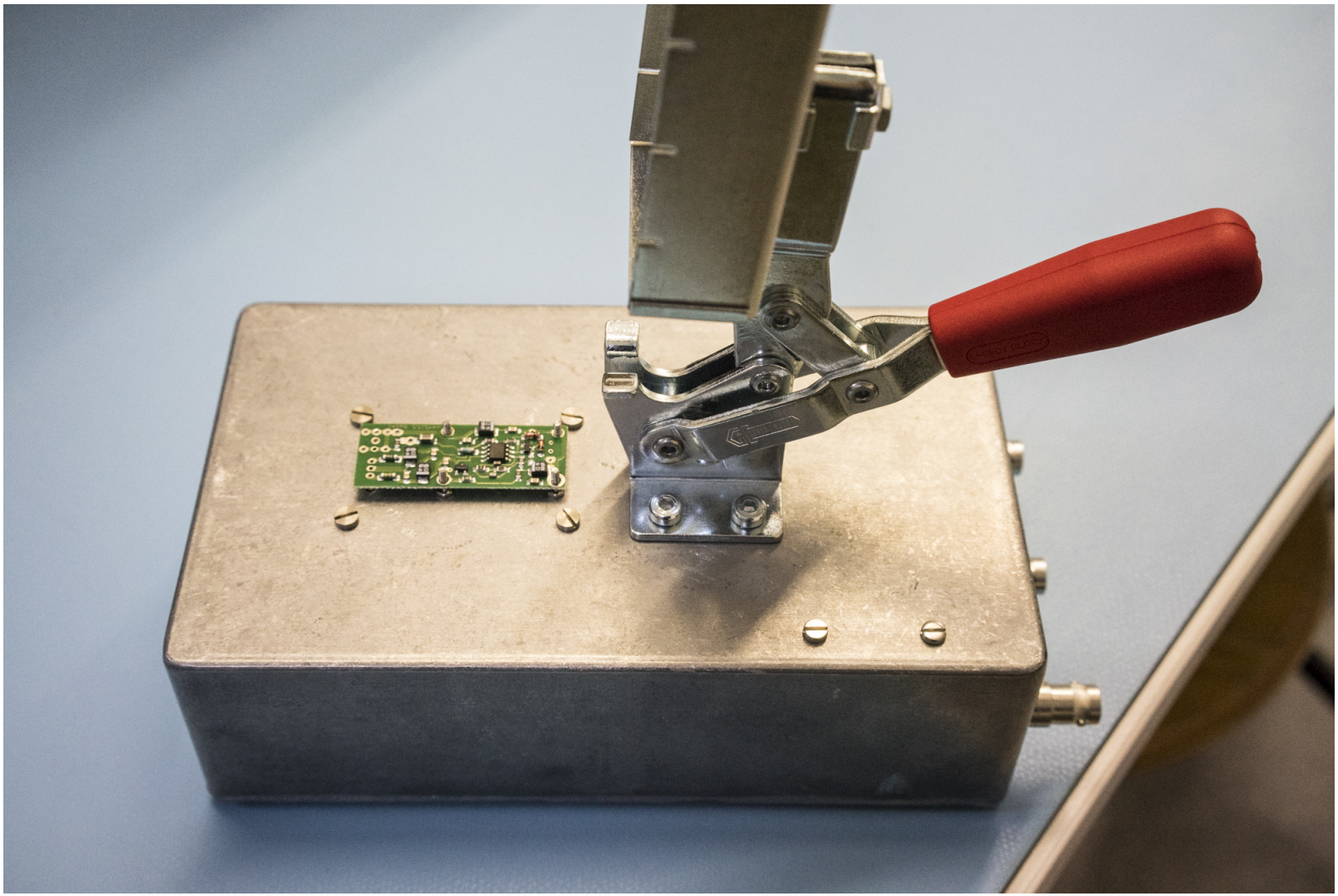
| | | SN 283 | | | SN 284 | |
|---|---|---|---|---|---|---|
| | | no pulser | pulser | | no pulser | pulser |
| +6 V | before | 635 uA | 648 uA | | 630 uA | 657 uA |
| | **after** | **600 uA** | **609 uA** | | **587 uA** | **596 uA** |
| | | | | | | |
| -6 V | before | 126 uA | 155 uA | | 119 uA | 146 uA |
| | **after** | **115 uA** | **134 uA** | | **110 uA** | **120 uA** |

# Test Setup

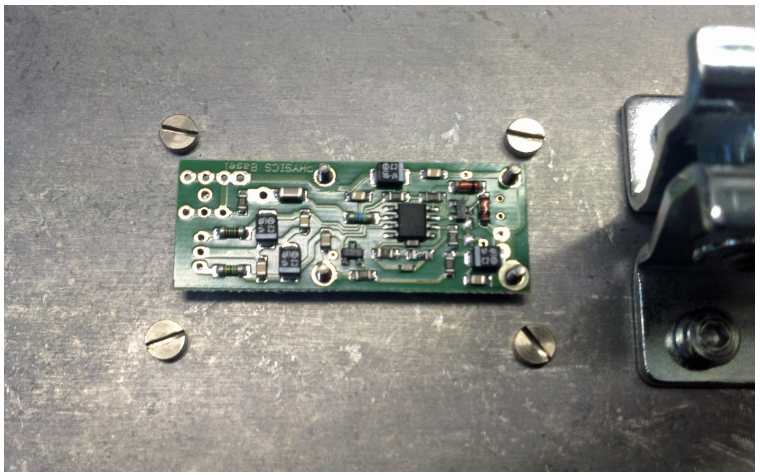
# Test Box for APD PreAmp's

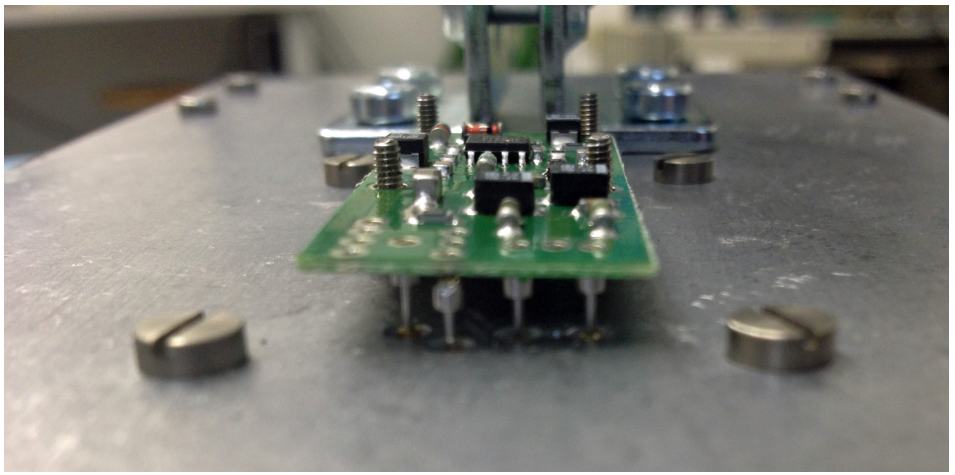


# Open Test Box for APD PreAmp's

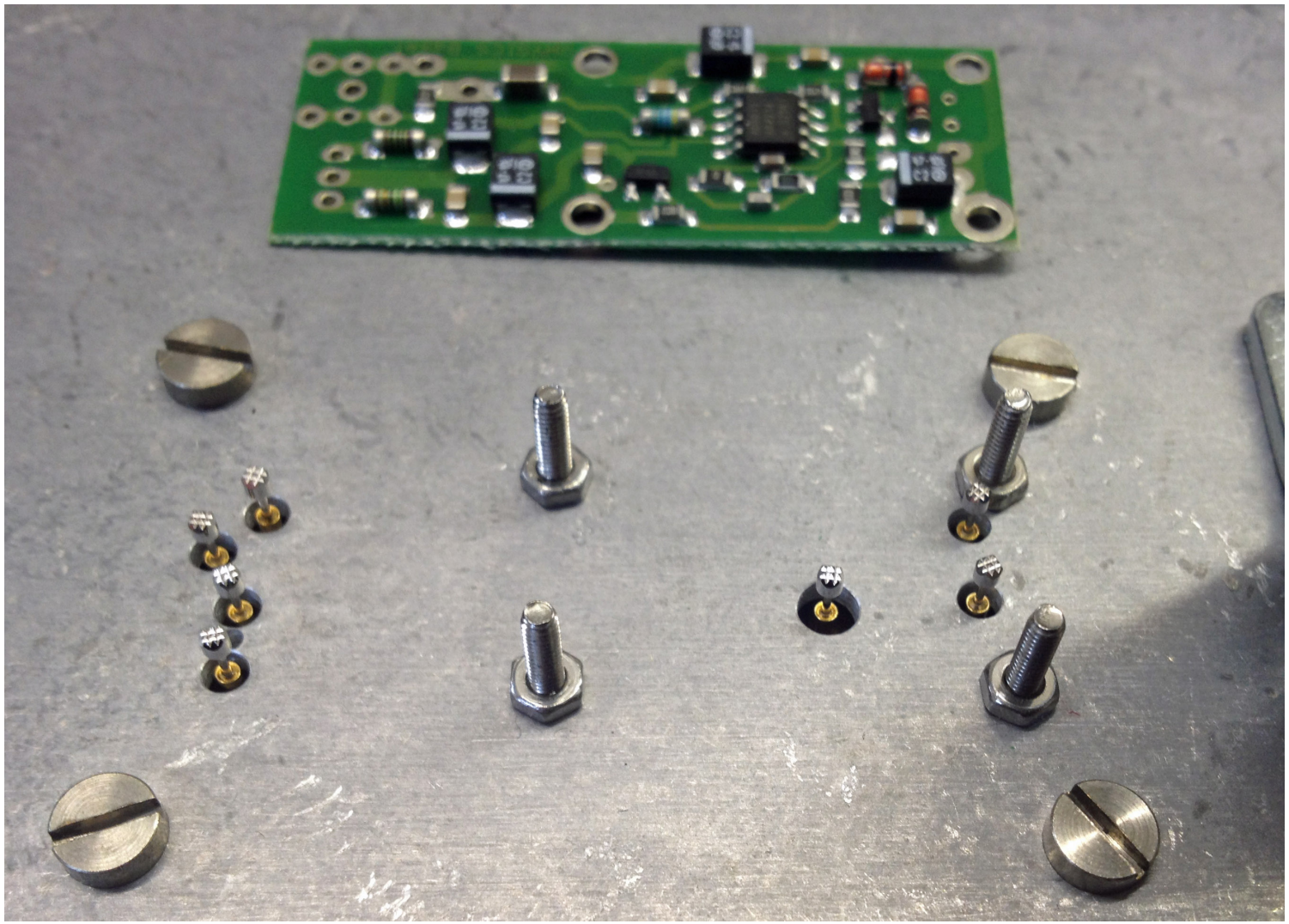


# Preamplifier Fixation

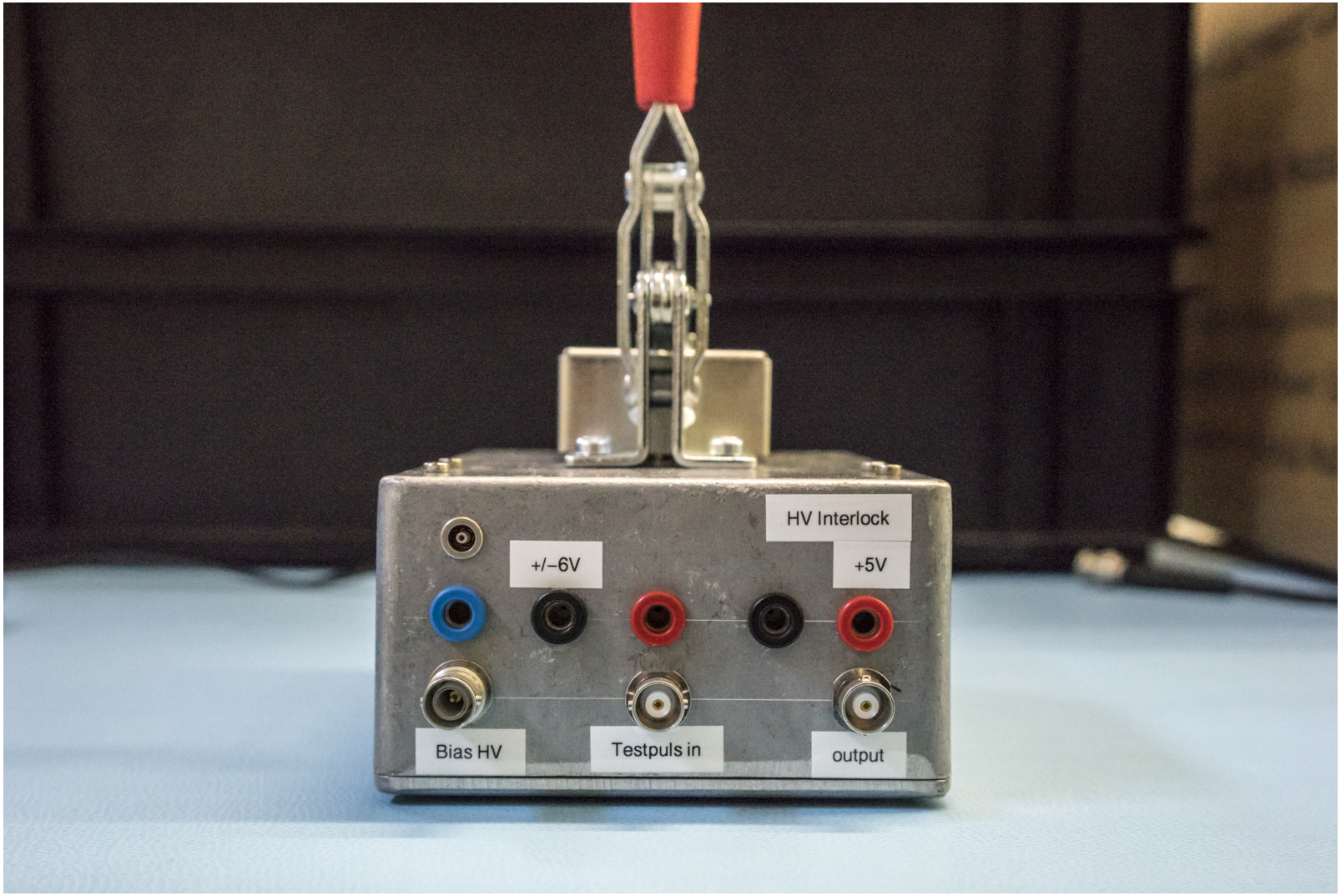




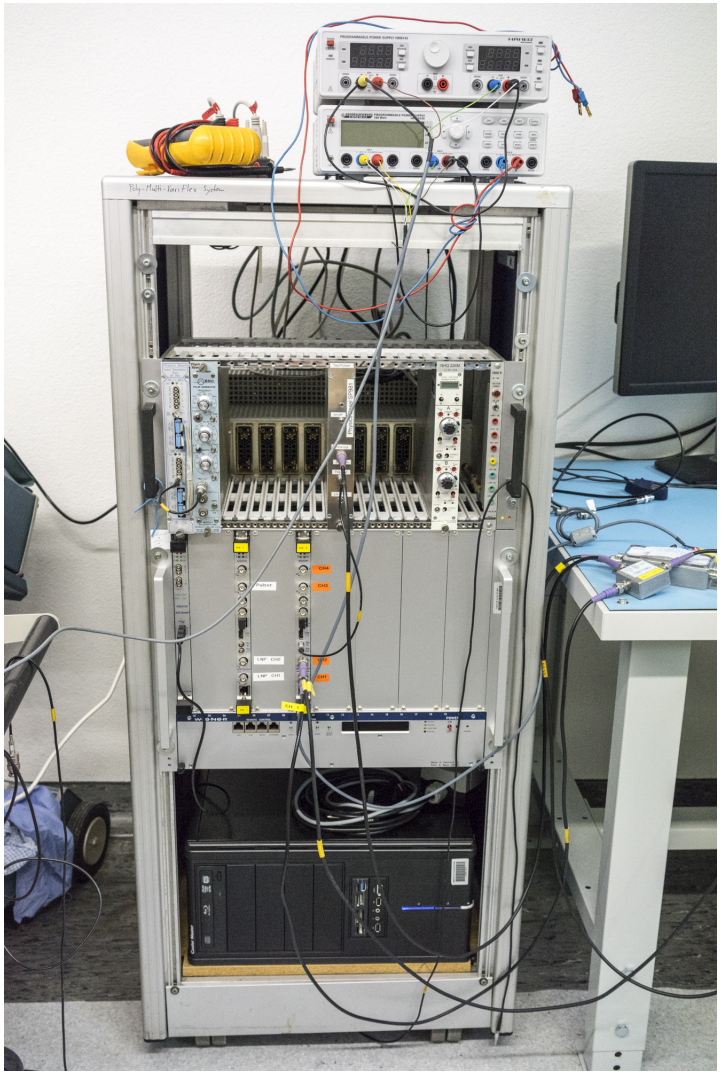
# Needle Bed



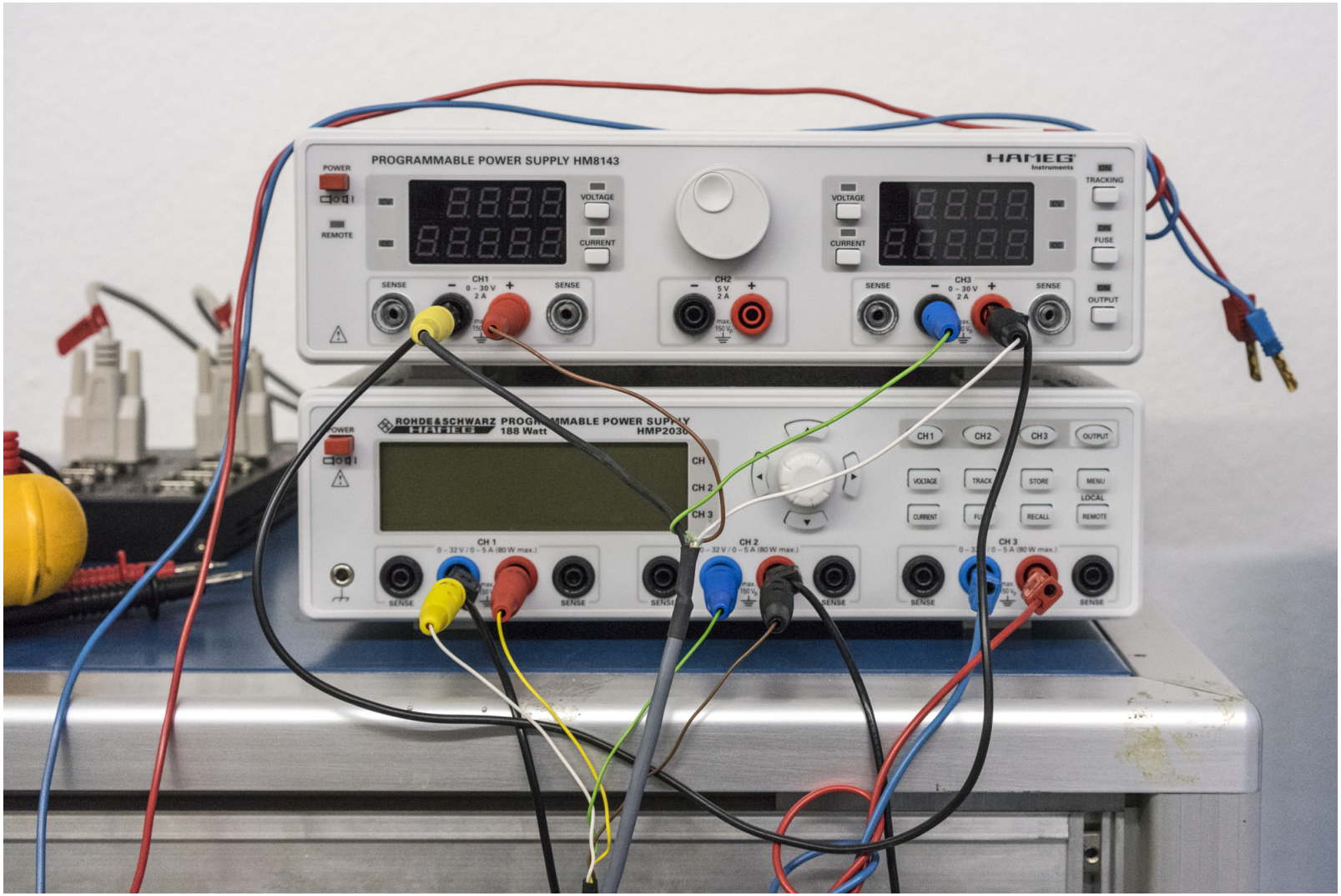
# Connections Test Box for APD PreAmp's



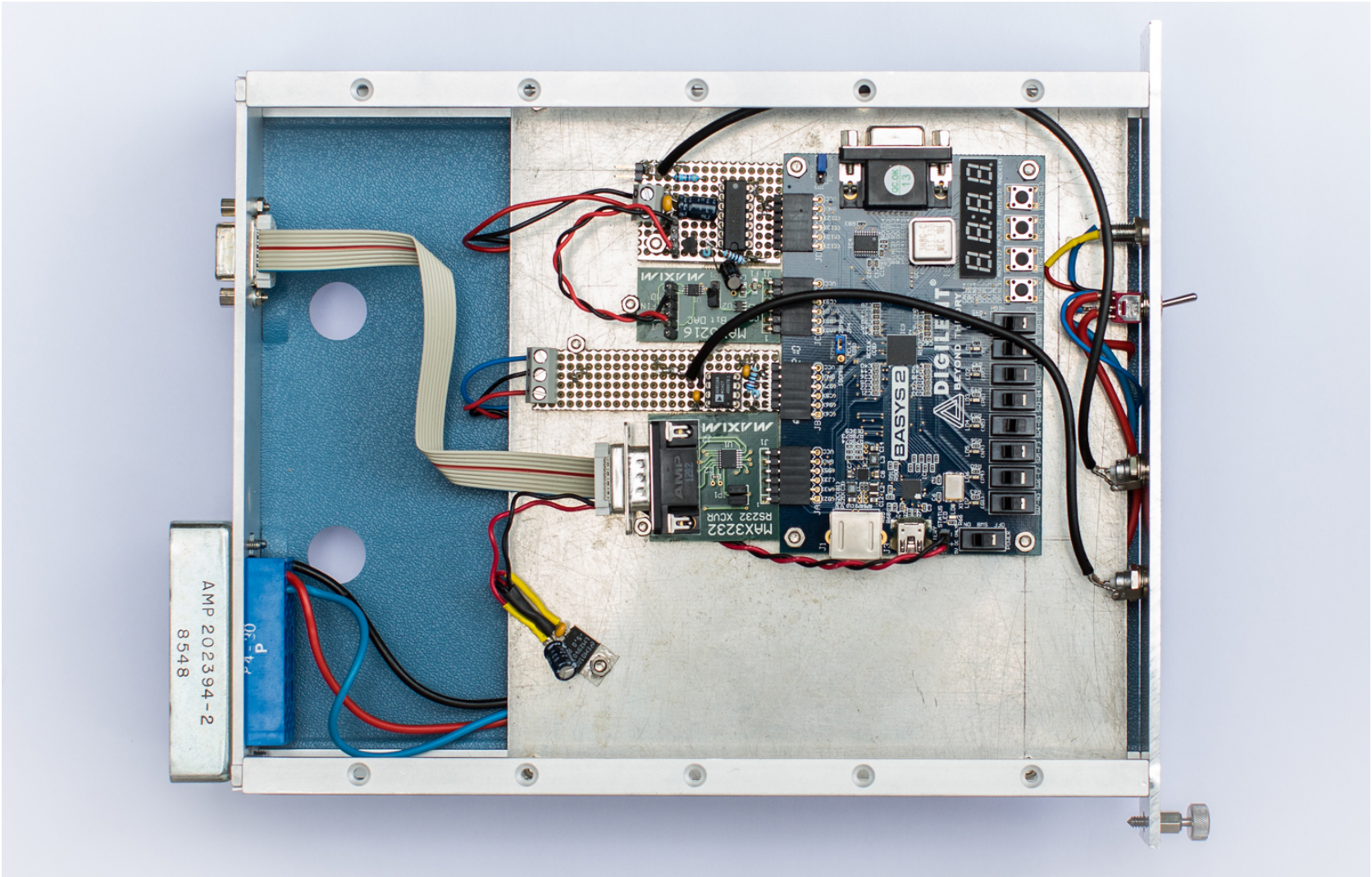
# Test Rack



# Power Supplies



# NIM FPGA Pulser Module



# Summary

- First Test of Radiation Hardness
- Irradiation of 7 kGy - 1.6% gain change
- Irradiation of 30 kGy - 2.1% gain change

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- First Test of Radiation Hardness
- Irradiation of 7 kGy - 1.6% gain change
- Irradiation of 30 kGy - 2.1% gain change
- Test Box for APD PreAmp's is ready