



# Switcher4 Irradiation



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Belle II PXD/DEPFET Meeting

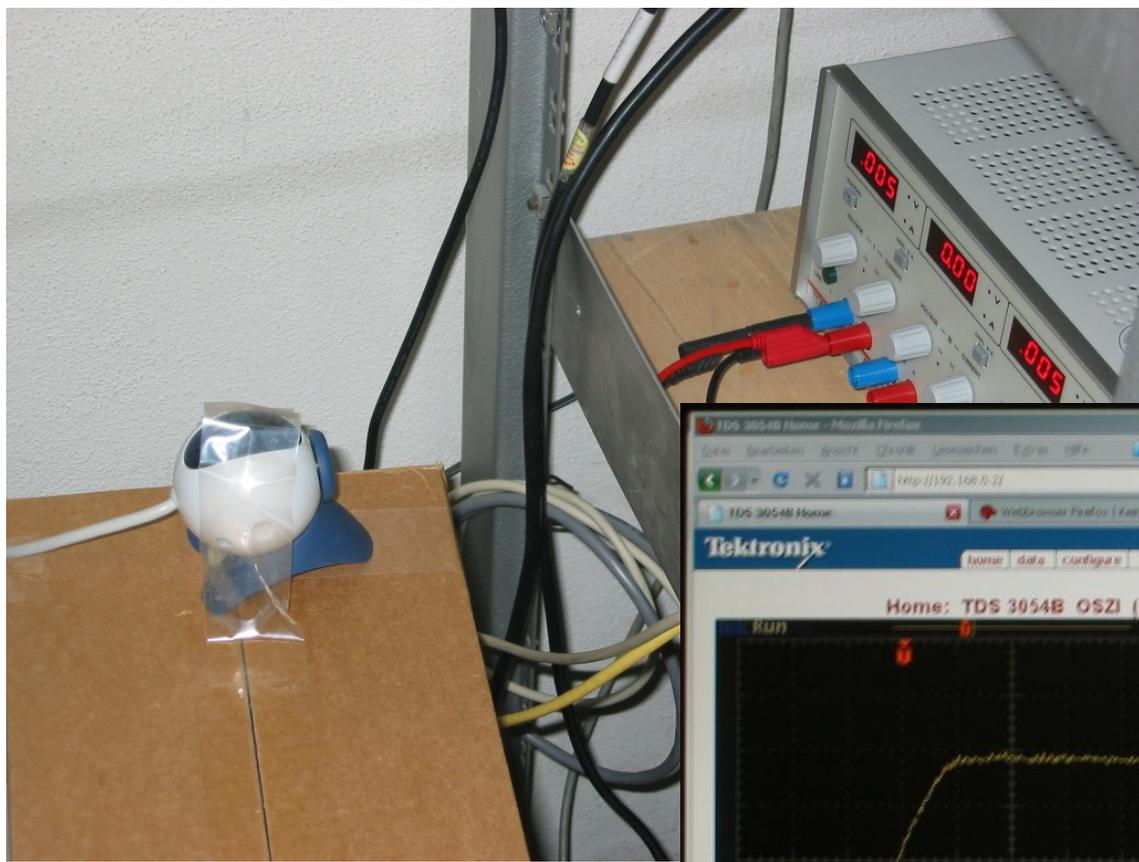
Prague

26.01.2010-27.01.2010

- Xray irradiation of Switcher4 testchip at Karlsruhe
  - Thanks to Karlsruhe for flexibility and support!
- Xray settings:
  - 60kV 33mA
  - Vanadium filter used
  - 175mm distance→ 527krad/h
- Duration: 72h → 36Mrad
- Chip was biased during irradiation

- Laptop at Karlsruhe
  - Switcher control software
  - Oscilloscope controlled via web
  - Webcam to monitor powersupply :-)
- connected to laptop at Karlsruhe from Mannheim
  - setup scope
  - Switch channel on and off
  - download data from scope
- improvements for next remote irradiation
  - use webcam to monitor Xray HV-generator
  - use GPIB powersupply instead of webcam :-)

# remote irradiation setup



The screenshot displays the web interface of the Tektronix TDS 3054B oscilloscope. The main window shows a waveform with the following parameters:

- Home: TDS 3054B OSZI (192.168.0.2)
- Ch1 Anstieg: 10.60ns
- Ch1 Abfall: 5
- Keine gültige Flanke
- 5.00 V
- H 10.0ns A Ch1 5.10 V
- 30.40 %

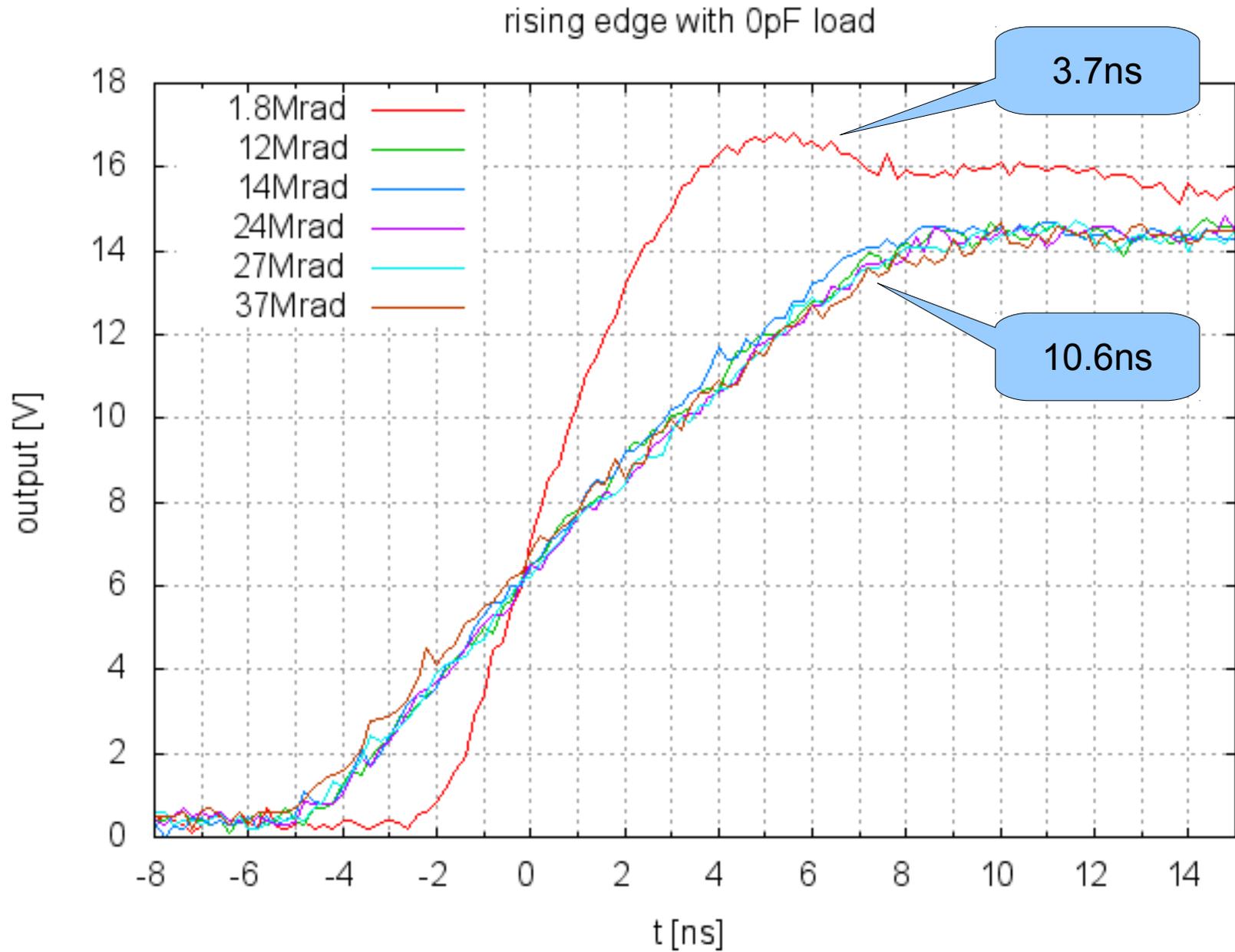
Below the waveform, there are controls for 'Typ', 'Quelle', 'Kopplung', 'Flanke', 'Pegel', and 'Modus Normal'. A 'Scanner- und Kamera-Assistent' window is open on the right, showing a preview of the oscilloscope and a list of captured images. The list includes:

Größe	Typ	Geändert am
9 KB	MVG-Bild	19.01.2010 16:27
13 KB	Textdokument	19.01.2010 16:28
9 KB	MVG-Bild	20.01.2010 14:04
12 KB	Textdokument	20.01.2010 14:04

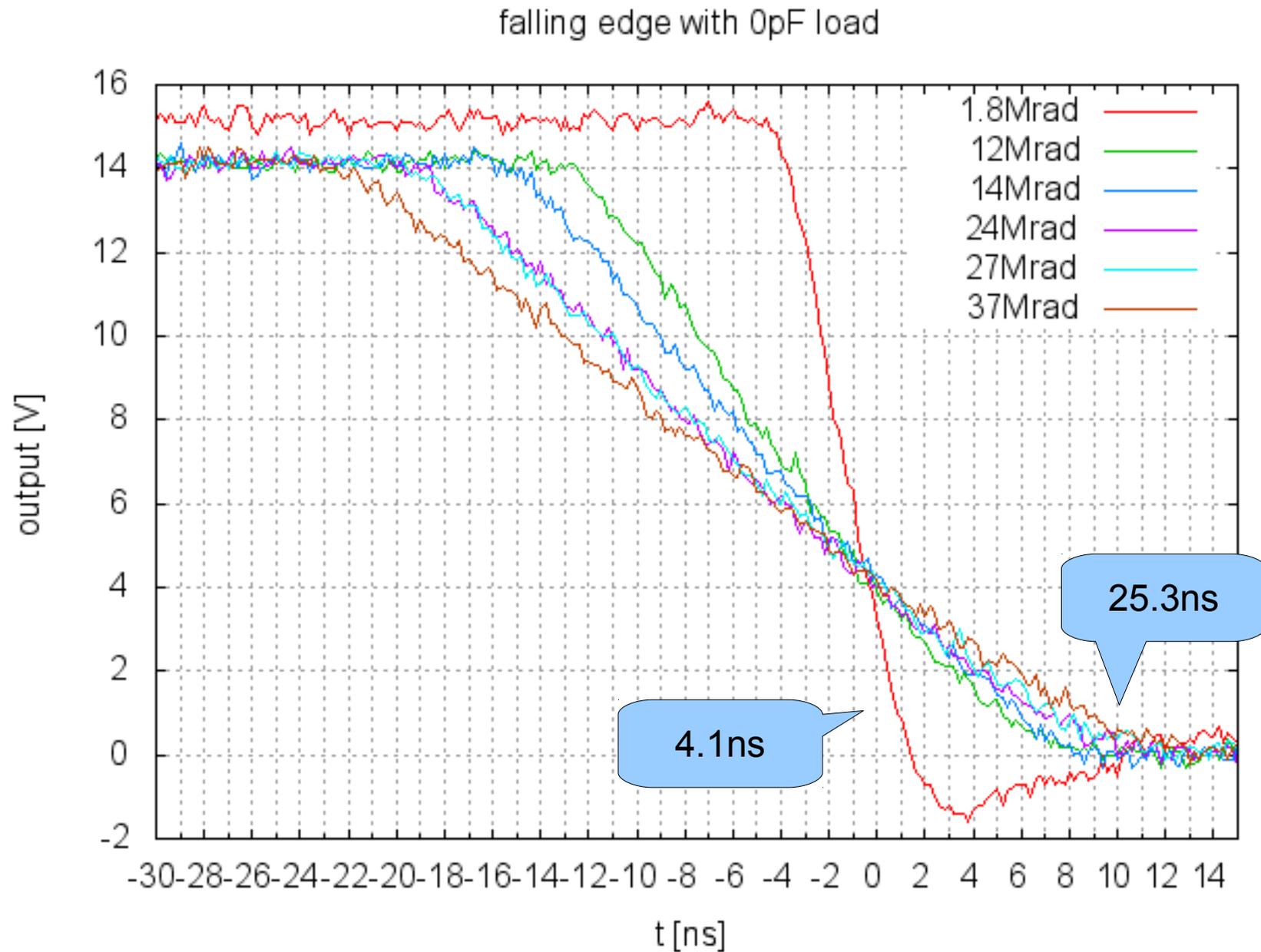
The 'Scanner- und Kamera-Assistent' window also includes buttons for 'Bild aufnehmen', 'Alle löschen', and 'Alle anzeigen', along with a 'Zurück' button.



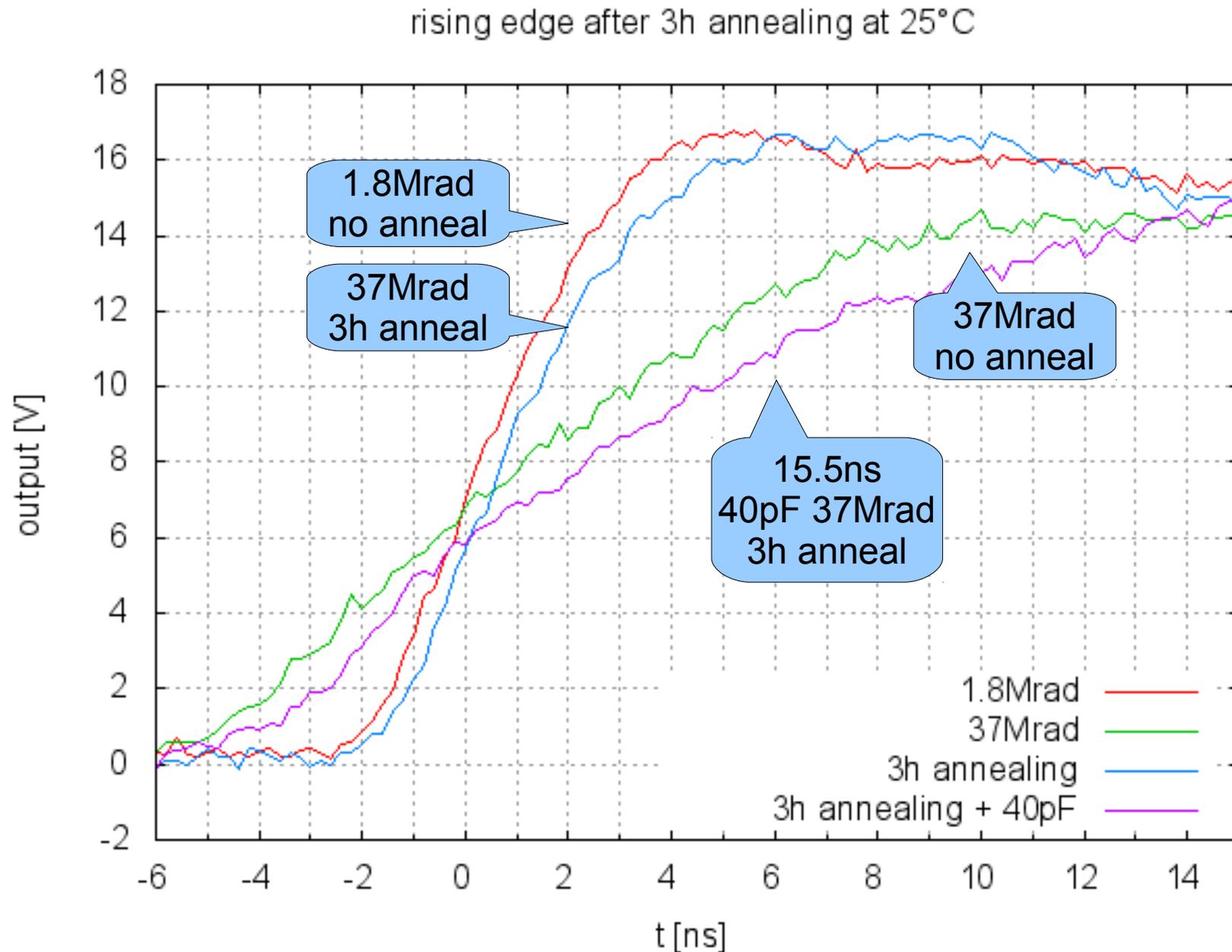
# rising edge



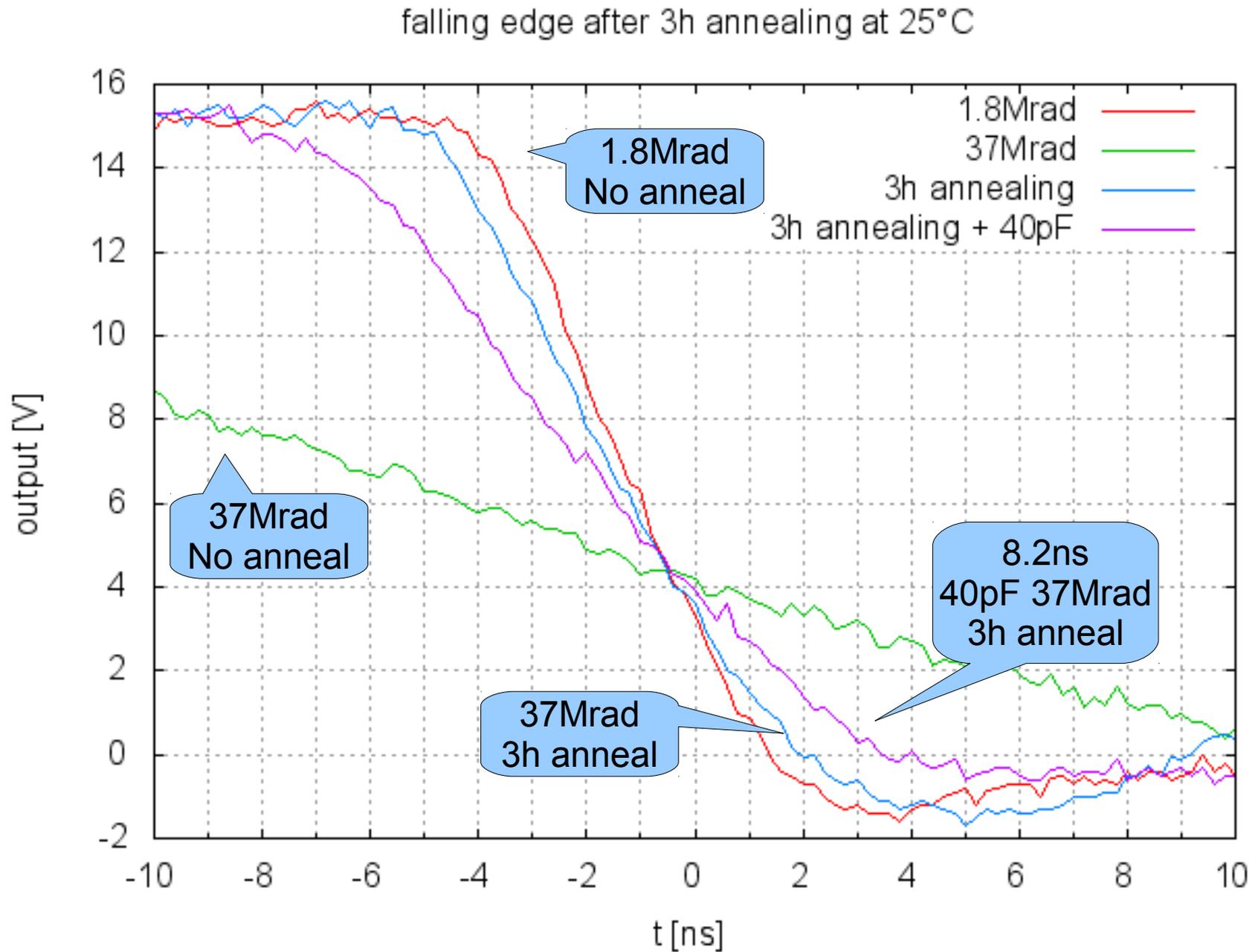
# falling edge



# Annealing effect - rising edge



# annealing effect - falling edge



- irradiation finished on friday
  - not all effects understood yet
- Chip is working after 37Mrad
- Supply current
  - increases from 10mA to 20mA within first 1Mrad
  - decreases down to 5mA
  - back to 10mA after annealing
- falling edge @ 40pF 37Mrad 3h annealing: 8.2ns
- rising edge @ 40pF 37Mrad 3h annealing: 15.5ns

Thank You!