

# A dosimetric protocol for the use of radiochromic film in radiotherapy quality assurance in Norway

Alexander Muring

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# Purpose of project

- **Main goal:** Relate absolute dosimetry (TRS 398) to 2-D dosimetry using radiochromic film in a clinical environment

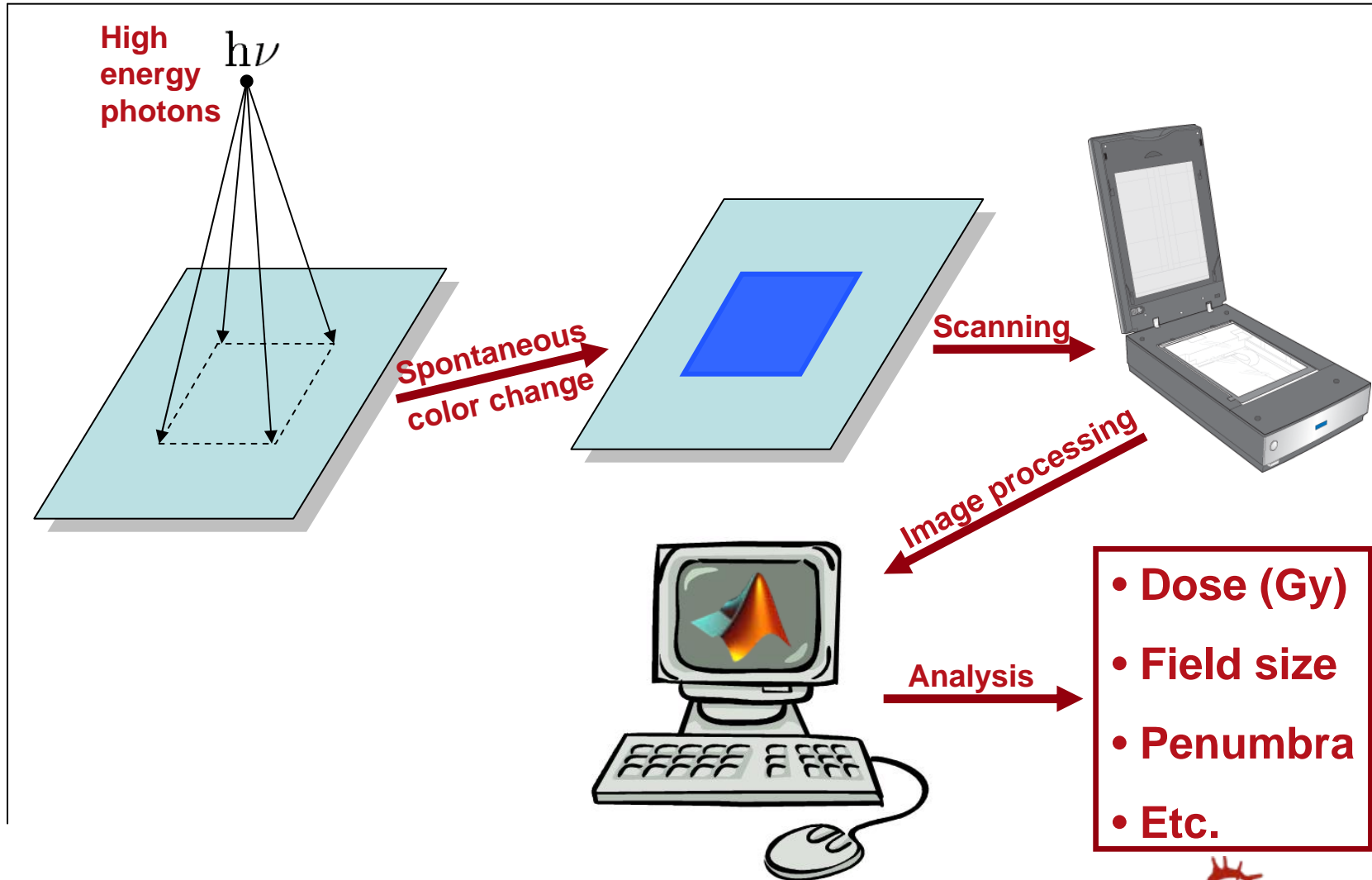
**SSDL:**



**Hospitals:**

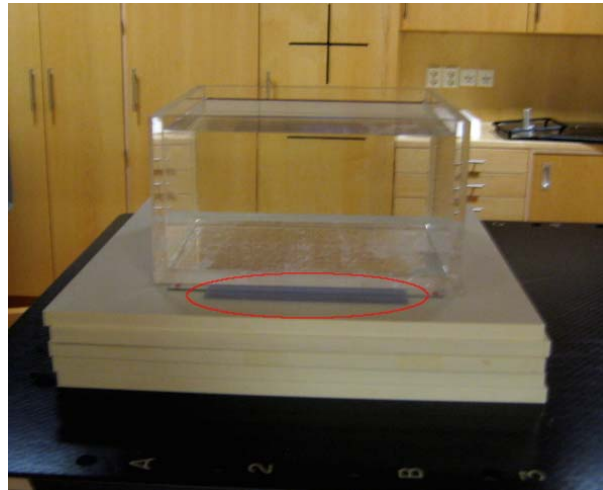
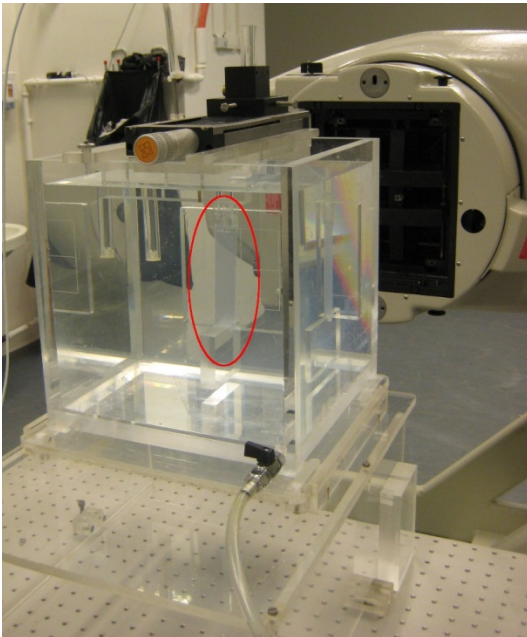


# Practical use of GafChromic® EBT film



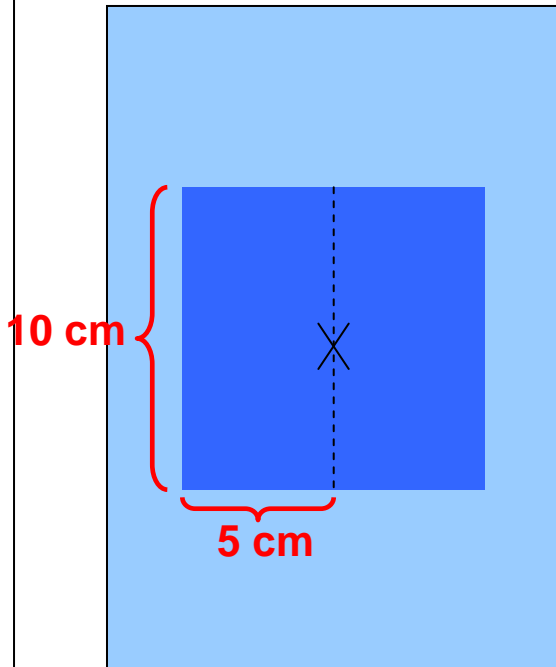
# Field setups – reference dosimetry

- 10x10 cm<sup>2</sup> field at hospital's reference conditions (TRS 398)
  - Both ionization chamber and film

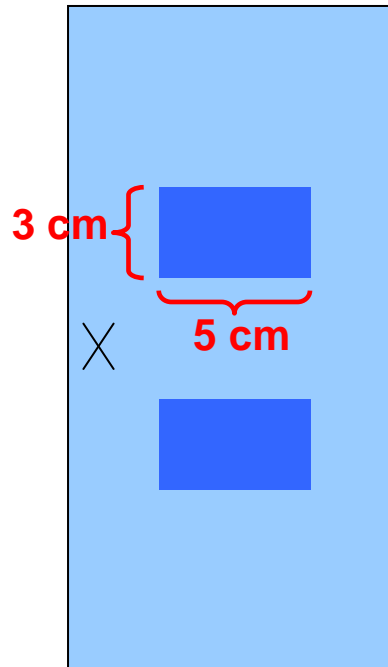


# Special field setups - film

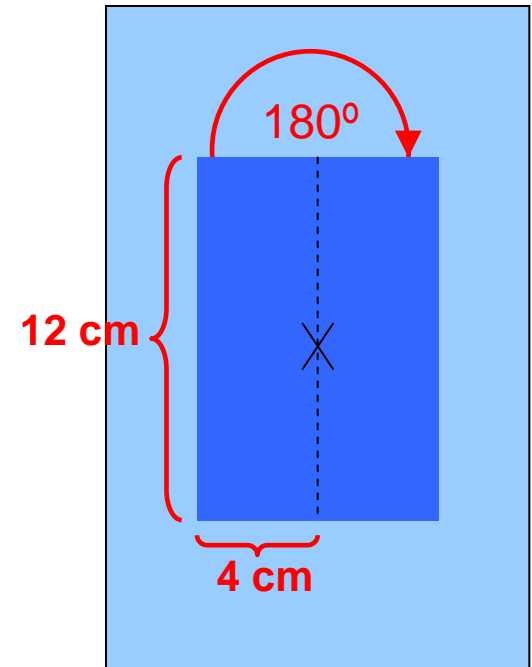
**Setup 1 – Abutted fields (no rotation)**



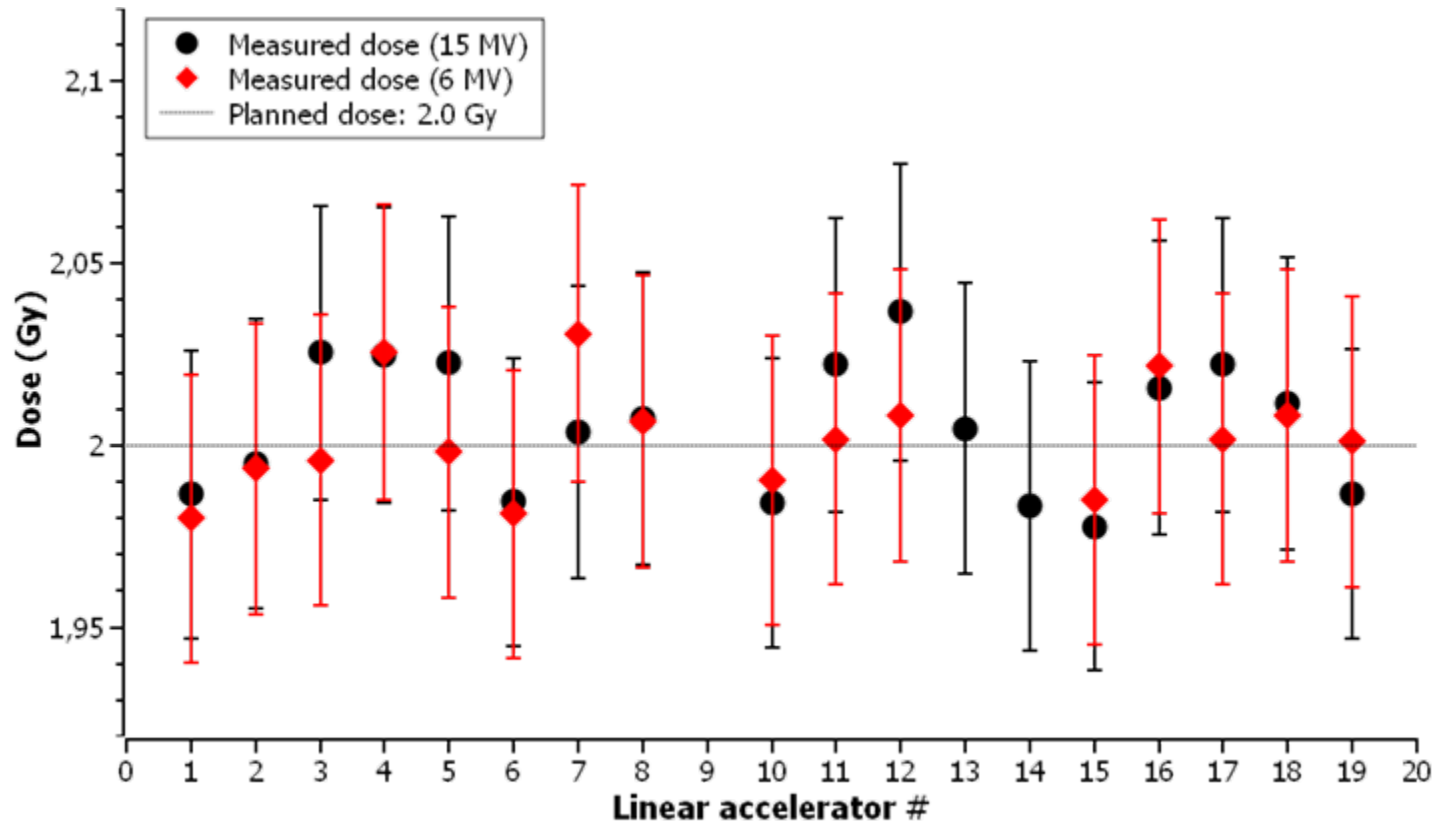
**Setup 2 – Overtravel fields**



**Setup 3 & 4 – Abutted fields (rotated)**



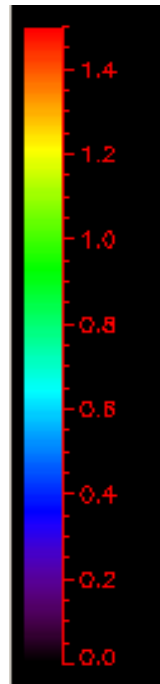
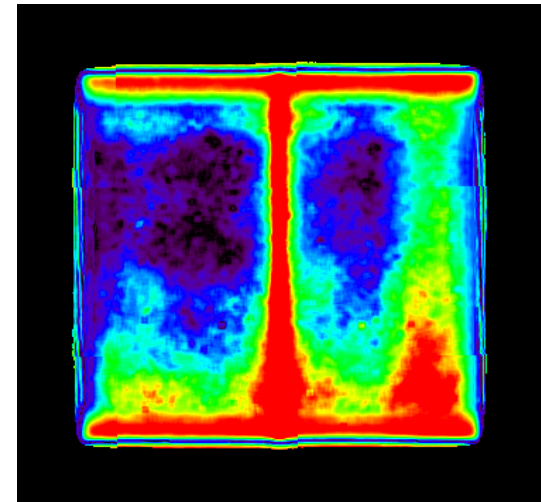
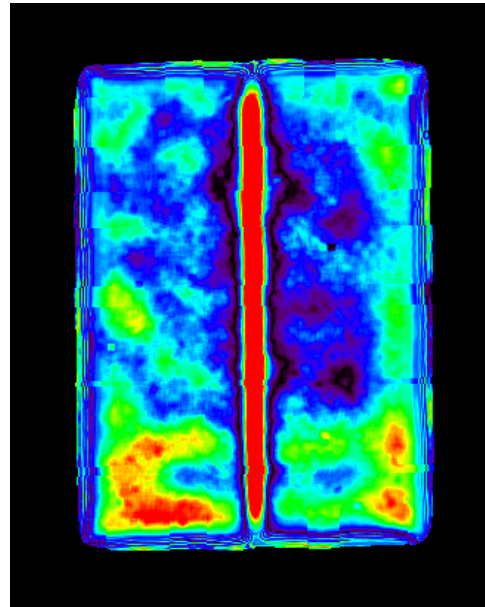
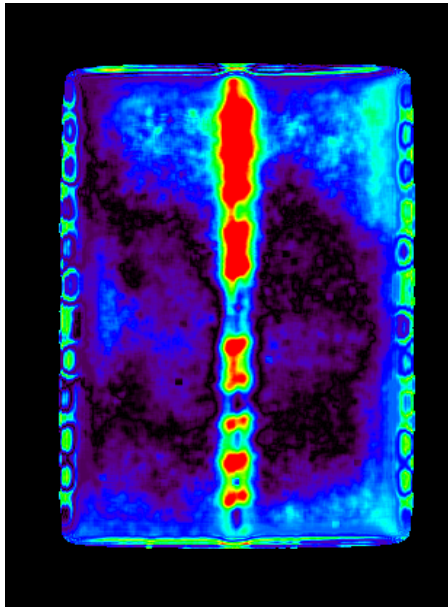
# Results – reference field



- Film measurements of field size, penumbra width, flatness and symmetry are also generally reasonable.

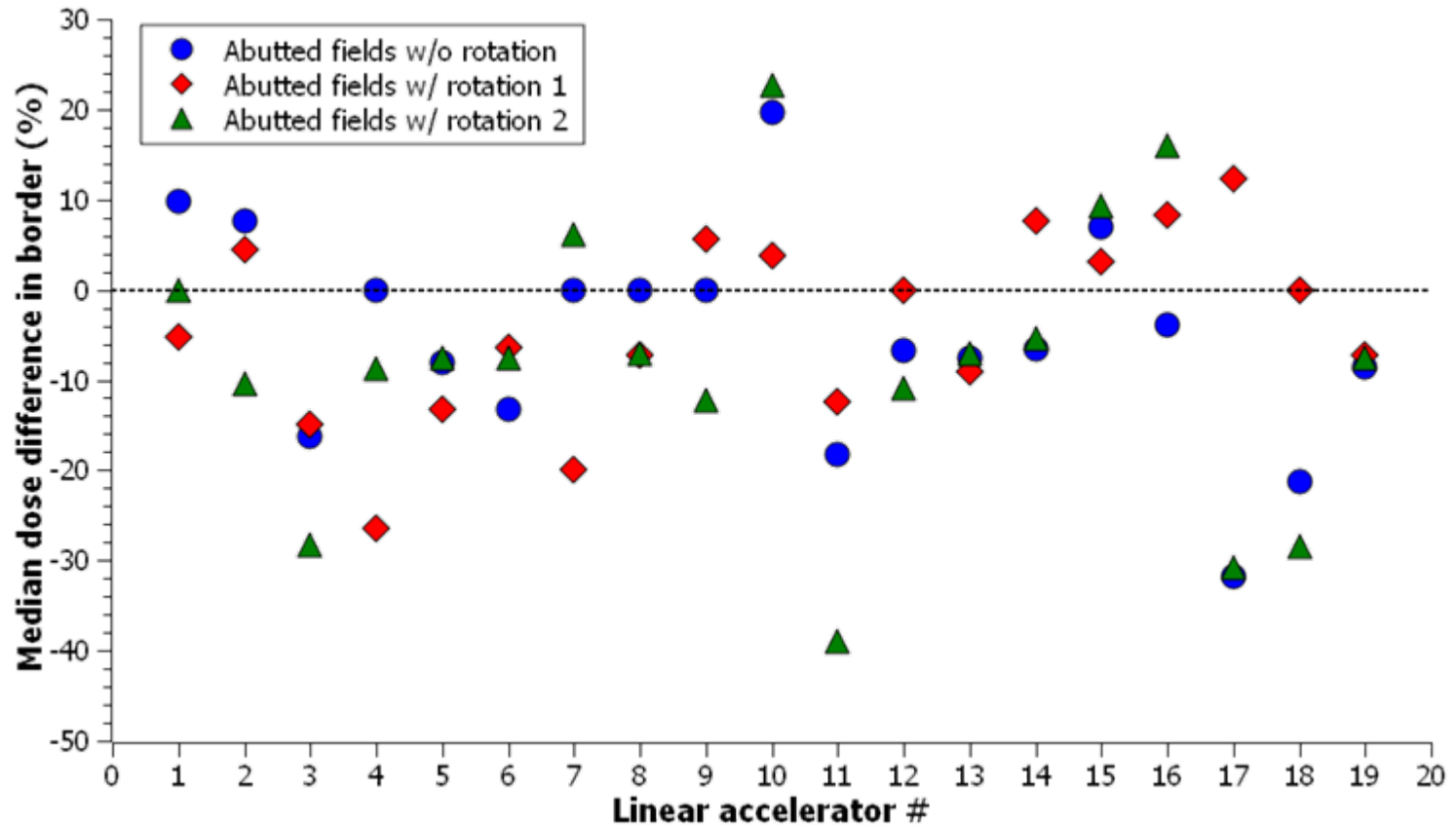
# Results – abutted field techniques

- Over-/underdosages in several cases
- 3 mm DTA and 5 % Dose difference



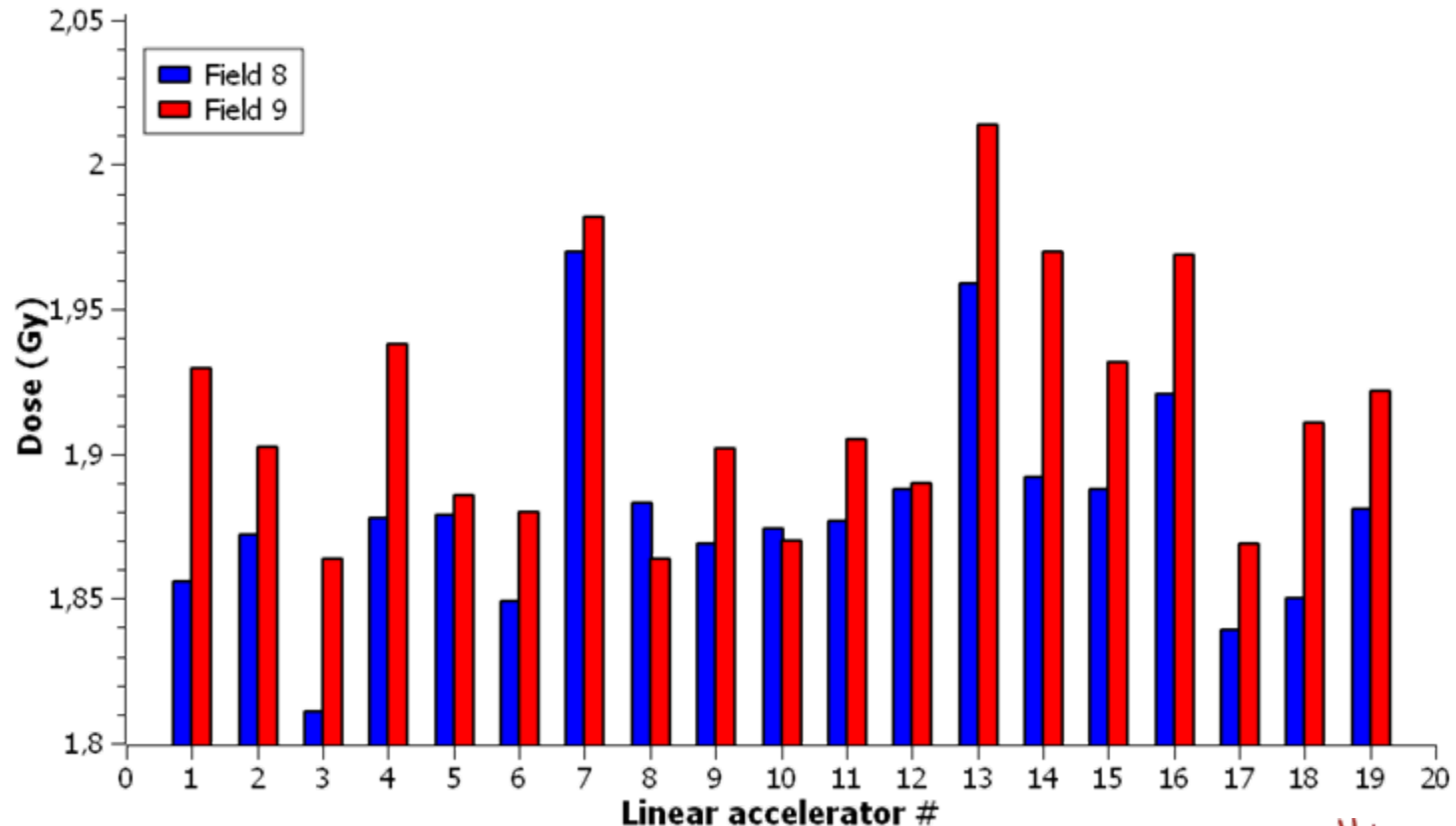
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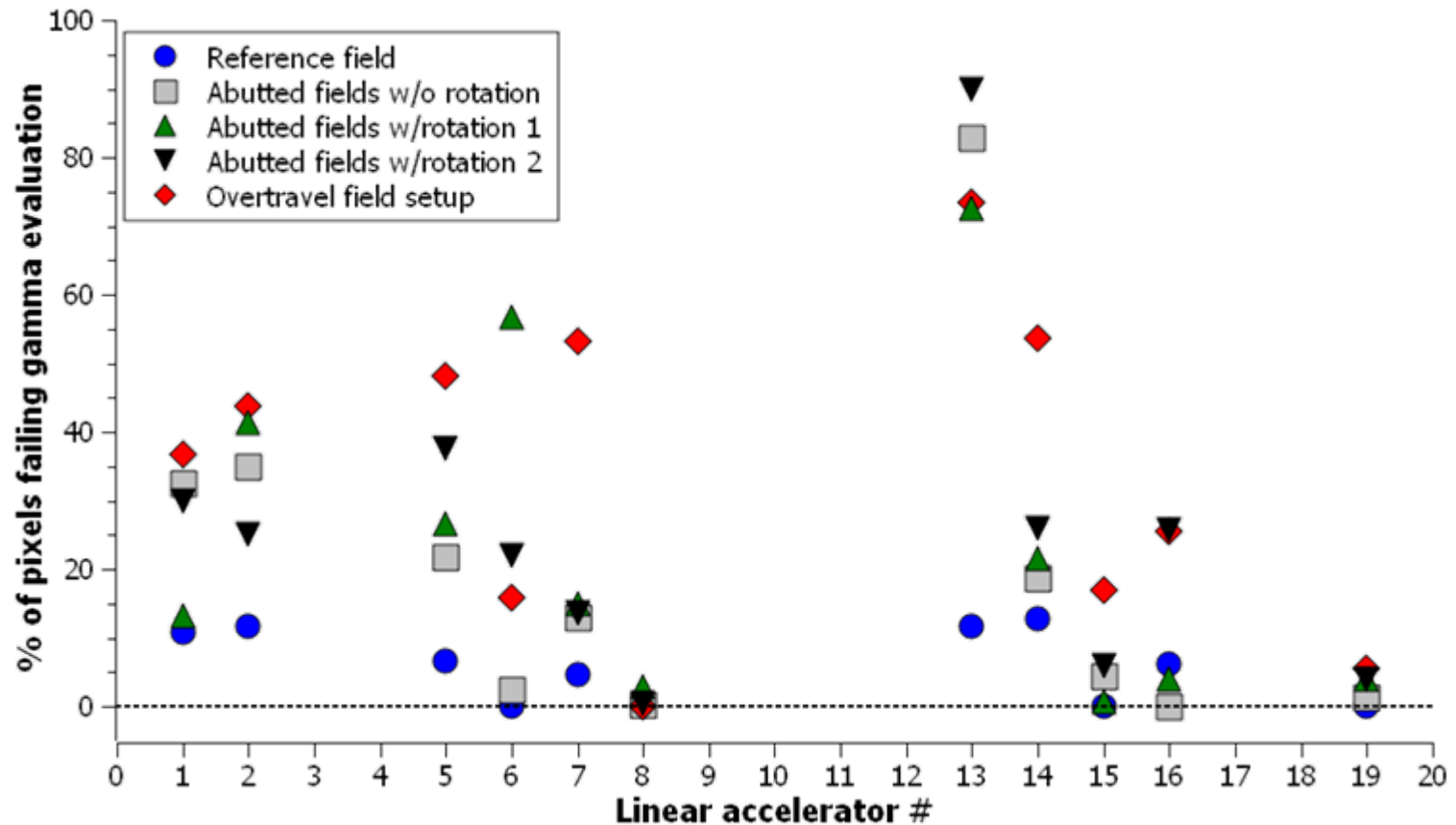
# Results – overtravel fields

- Good geometrical reproducibility, but some difficulty in predicting field doses.



# Gamma evaluation

- 3 mm DTA and 5 % Dose difference



# Some general conclusions

- Hospitals are generally successful in reproducing their standard reference field
- For the specialized field setups, results deviate more
  - Deviations of up to  $\pm 20\%$  in borders for abutted fields
  - Collimator rotation amplifies errors even further
  - Difficulties in predicting doses to overtravel fields
- GafChromic(R) EBT has proven itself as a useful tool, but care must be taken when used for absolute dosimetry!

# Published reports from the project

- Master's thesis: "A novel dosimetric protocol for high energy photon radiotherapy beams in Norway using radiochromic film"
- Two NRPA-reports in Norwegian:
  - Methodology – "recipe book"
  - Results from project
- All available from NRPA website:
  - <http://www.nrpa.no>

