

# Preparations for first dosimetry experiments at PITZ

Absolute dosimetry using Gafchromic films

PITZ Physics Seminar 15.09.2022

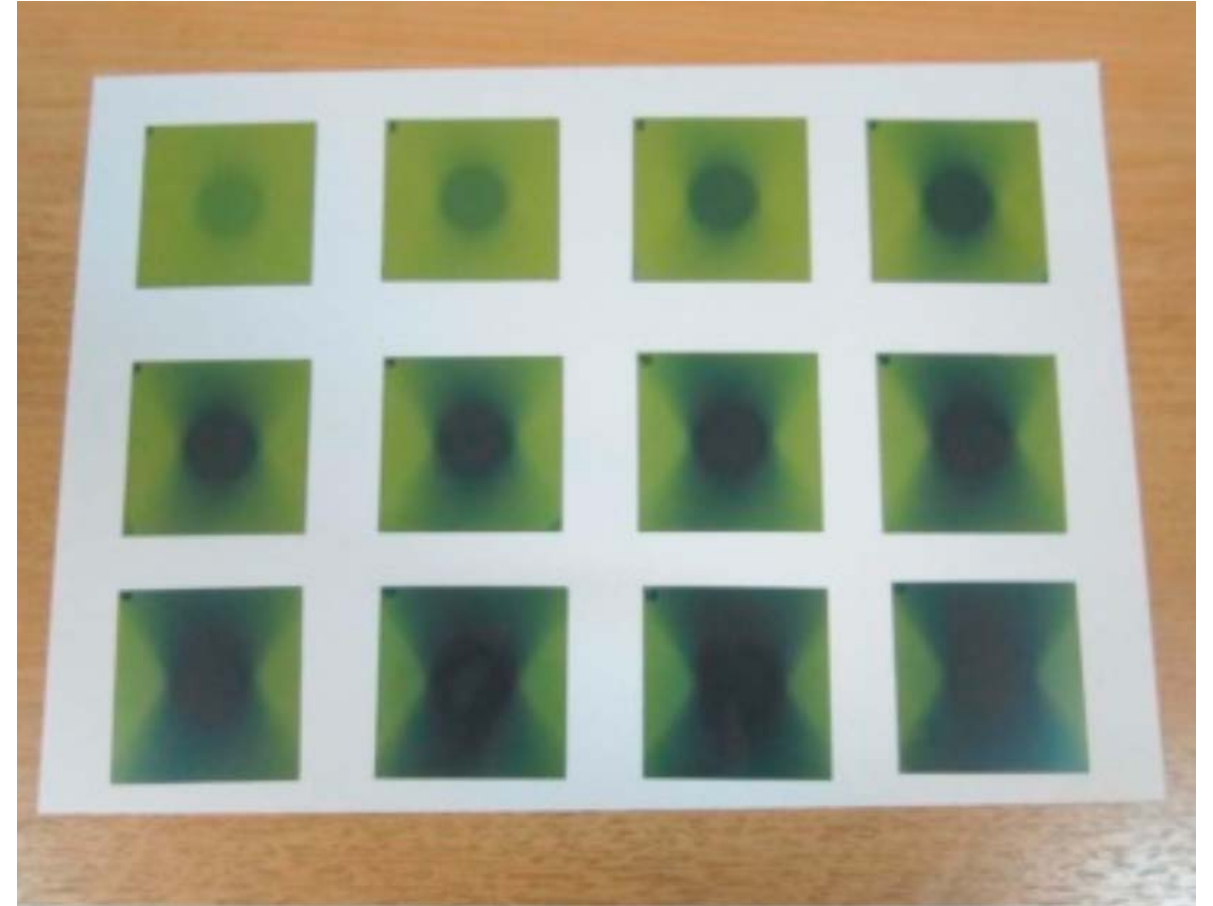
Felix Riemer

Ph.D. student (Detector development)



# About Gafchromic film

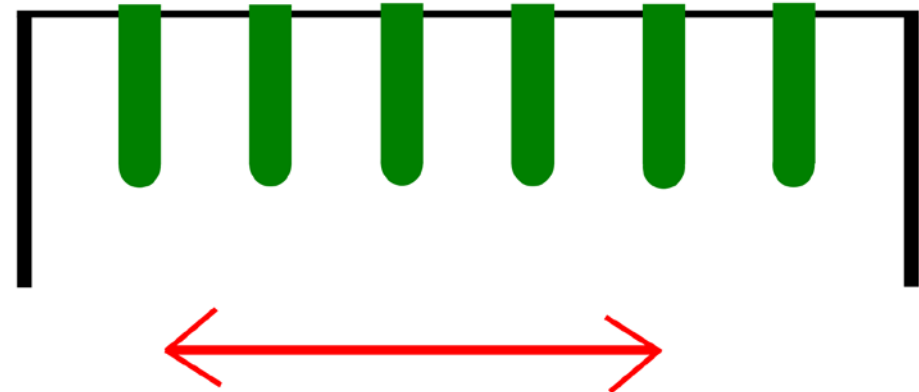
- Film contains dye which changes color when exposed to radiation → passive detector
- Sheets of 20 cm x 25 cm: can be cut to any size
- Change of optical density: Proportional to absorbed dose → absolute dosimetry
- Analysis using a flat bed scanner: provides high spatial resolution (mm-scale) depending on scanner
- Calibration is needed:  
External irradiation at medical beam
- Accuracy up to 2% for doses from 0.2 to 200 Gy



# Implementation at PITZ

- First very simple experiment planned at PITZ:
- Measurement of stray radiation behind EMSY 1
- Strip of film will be placed around the beam pipe
  
- Expose film → exchange film → change beam parameters → expose next film (repeat several times)
  
- Dedicated dose is needed
- **How can we do that at PITZ?**
  
- Requirement for all biology/dosimetry measurements:  
**Laser shutter** (#bunches can be controlled)

- Combination with experimental setup from TH Wildau is possible
- Behind exit window in second tunnel
- Movable probe holder (black) with multiple probes inside (green)
- Advantage: Several probes without opening the tunnel



Sketch of probe holder from TH Wildau

**Thank you!**