

# QUALITY ASSURANCE OF RADIOTHERAPY USING SCATTERED X-RAY

## POSTER TEASER

### TEAM 3

**Students:** Tatiana Kashtanova, Samuel Ydenberg

**Mentors:** Dr. Xun Jia, Dr. Lin Su (JHH)  
Dr. Yujie Chi (UT Arlington); Dr. Youfang Lai, Dr. Xiaoyu Hu (JHH)

**Radiation Therapy:** maximum dose to the tumor, minimum dose to the normal tissue

**Quality Assurance:** the procedures ensuring the precise and safe dose delivery

**Challenges:**

- Patient mispositioning
- Organ movements
- Anatomical morphological changes

**Consequences:** Underdose / Overdose

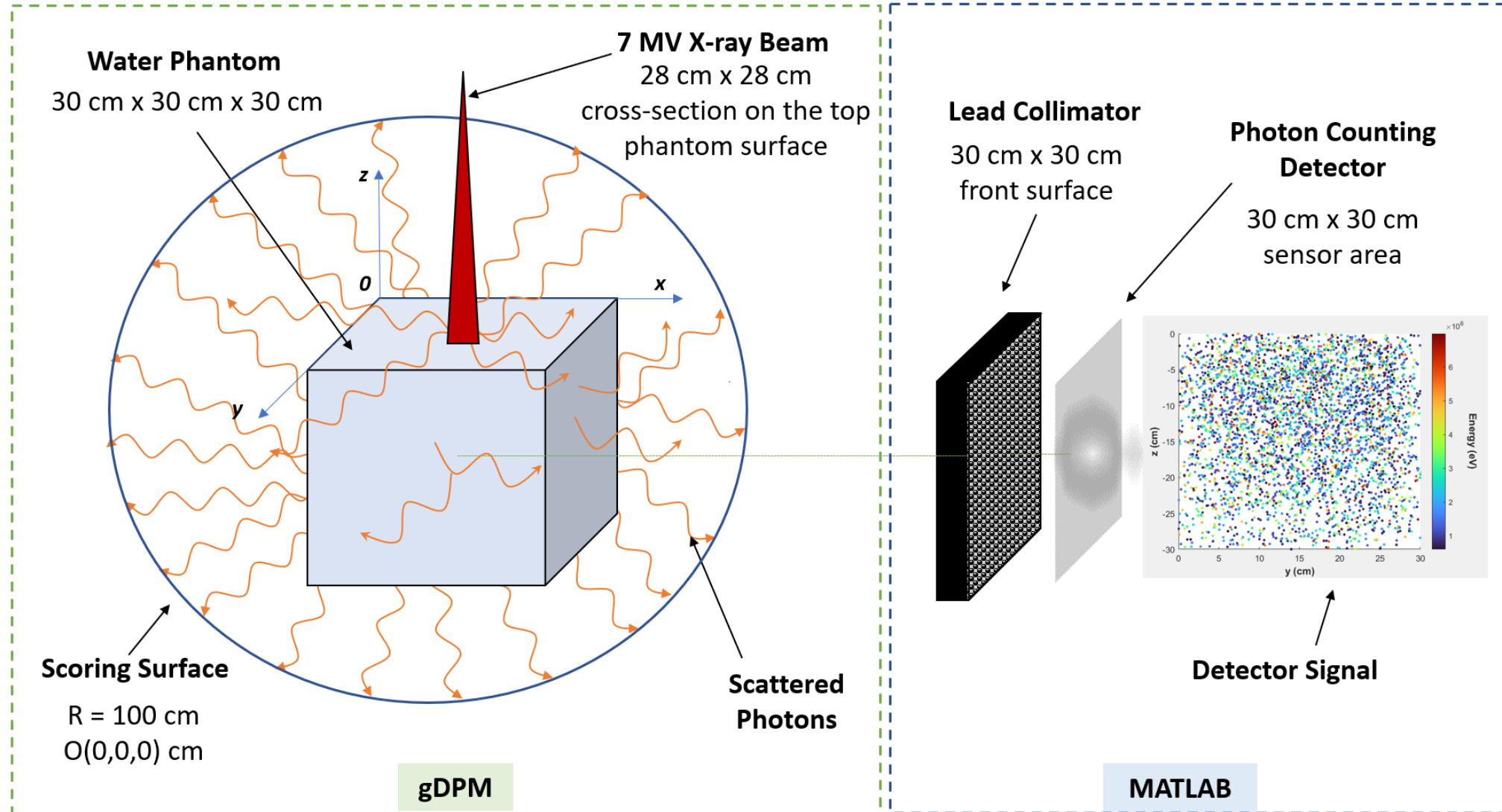
**Current solutions:** IGRT, ART → Extra-dosage

**Project:** A system for real time depth-dose verification with no extra-dosage using scattered photons registration



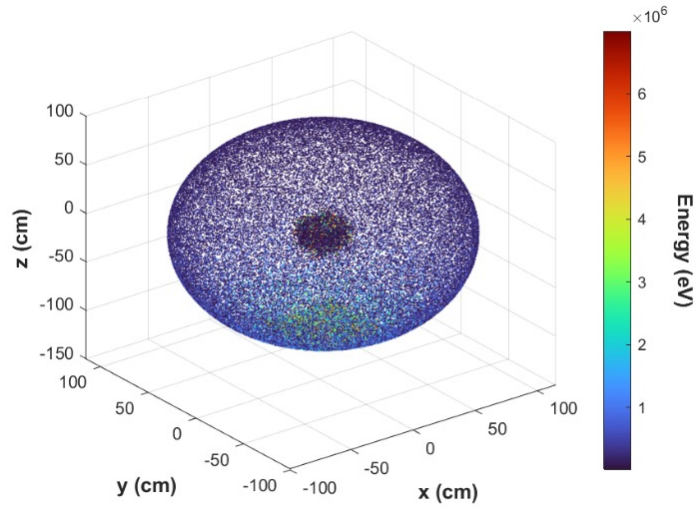
<https://images.app.goo.gl/Y4493cVg6LhvWzEC7>

# SYSTEM DESIGN

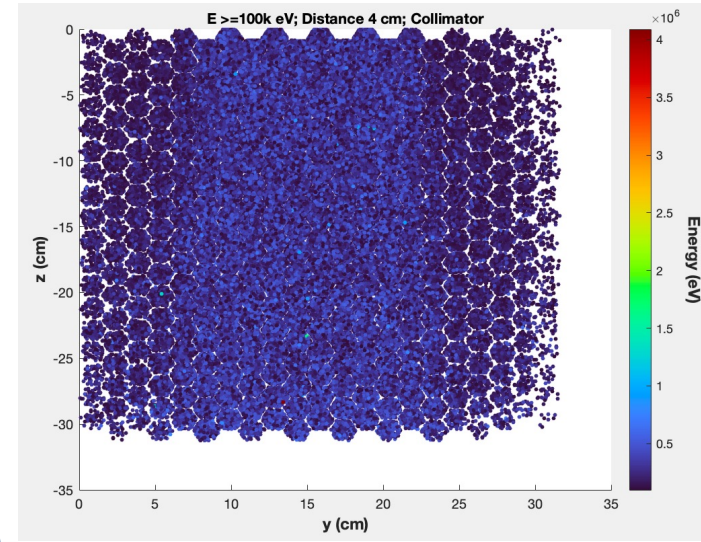


# SYSTEM IN ACTION

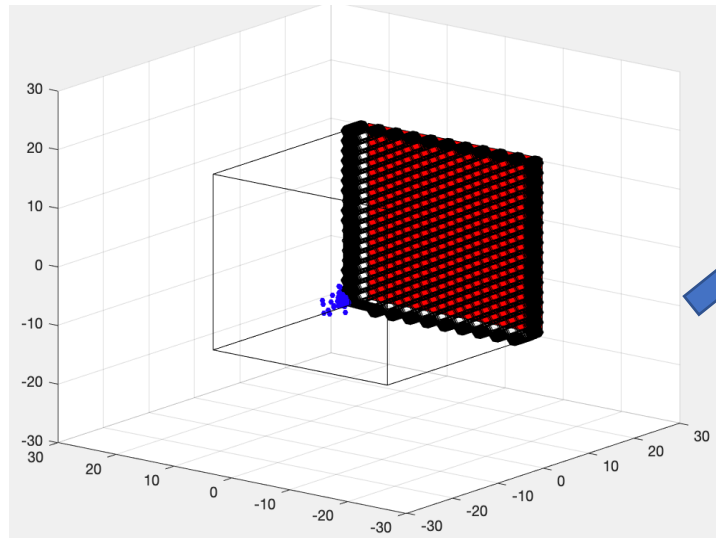
## gDPM Scoring Surface



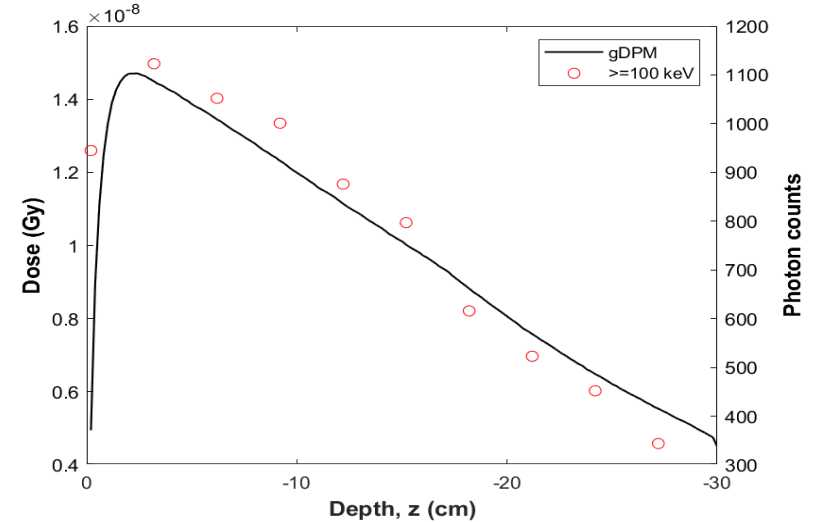
## Detector Signal



## Photon Counting Detector



## Dose & Photon Counts Profiles



# POSTER PRESENTATION

May 11, 2023

- System
- Testing
- Challenges
- Results

(homogeneous & heterogeneous phantoms)