

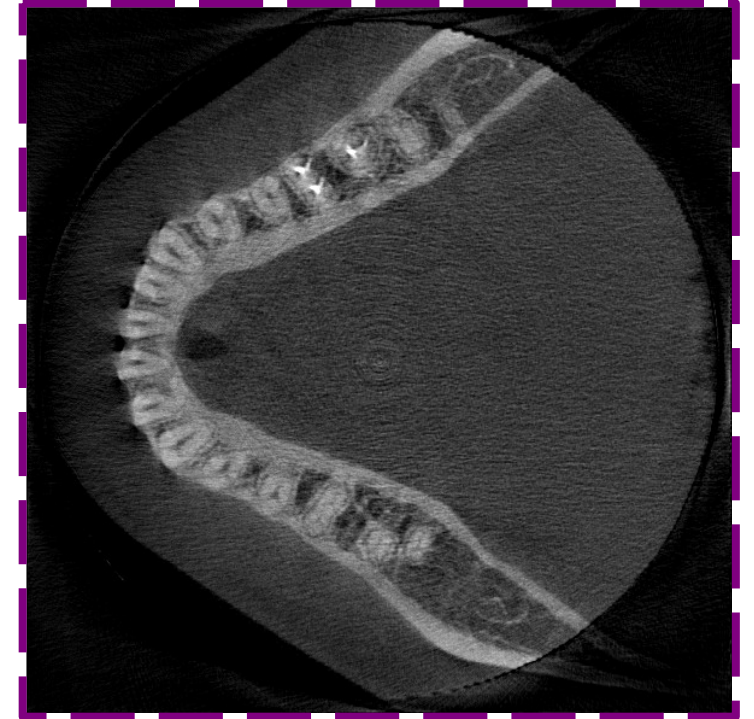
Scatter Modeling for dental CBCT Using Gaussian Models and DL

Context:

- Supervised training in medical imaging requires **large** datasets with **ground truths**.
- Physics-based **simulations** can generate controlled training data when real annotated data are **limited**.
- In CBCT, a secondary signal, called the **scatter**, introduces a bias on the measurements and is harder to simulate.

Current Limitation:

- Monte Carlo simulation provides physically **realistic** scatter estimates; but is too **computationally expensive** for large-scale dataset generation.



Scientific Question:

Can trainable ML models approximate Monte Carlo scatter while remaining reliable in challenging cases involving metal?

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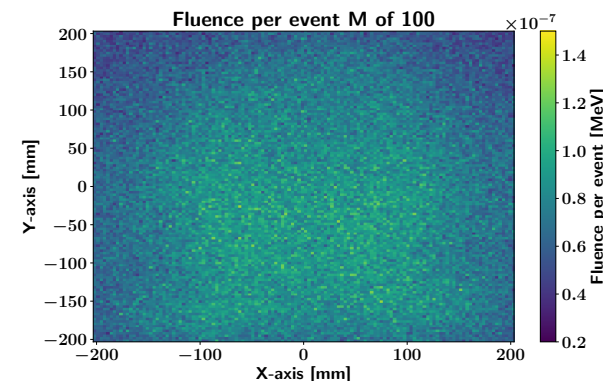
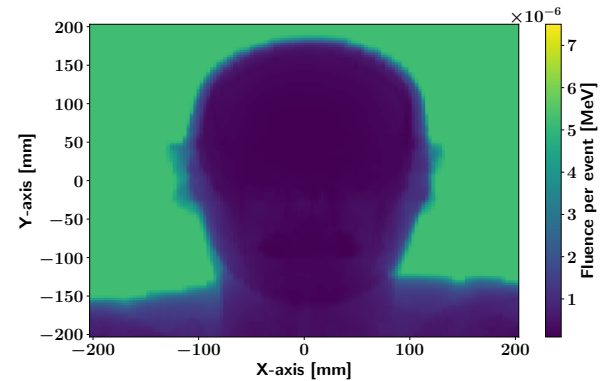
Objective:

Develop and evaluate models for physically realistic CT scatter simulation, with particular attention to robustness in the presence of metal.



Digital Phantom

Perform Complex
Simulation



Primary Signal

Scatter Signal

Trainable model
learns scatter from
primary

Evaluate

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