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Advancements of Artificial Intelligence in Proton Therapy

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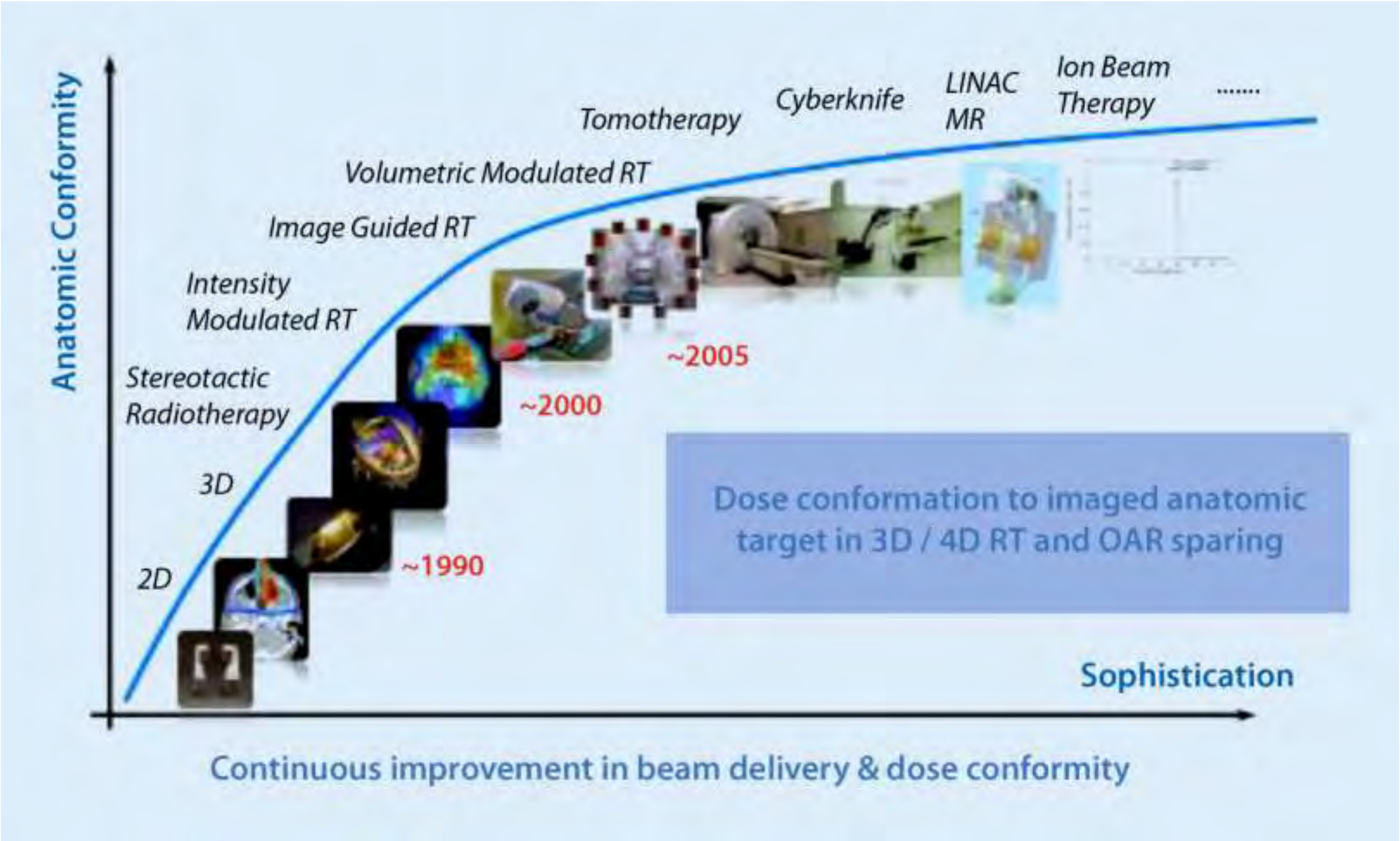

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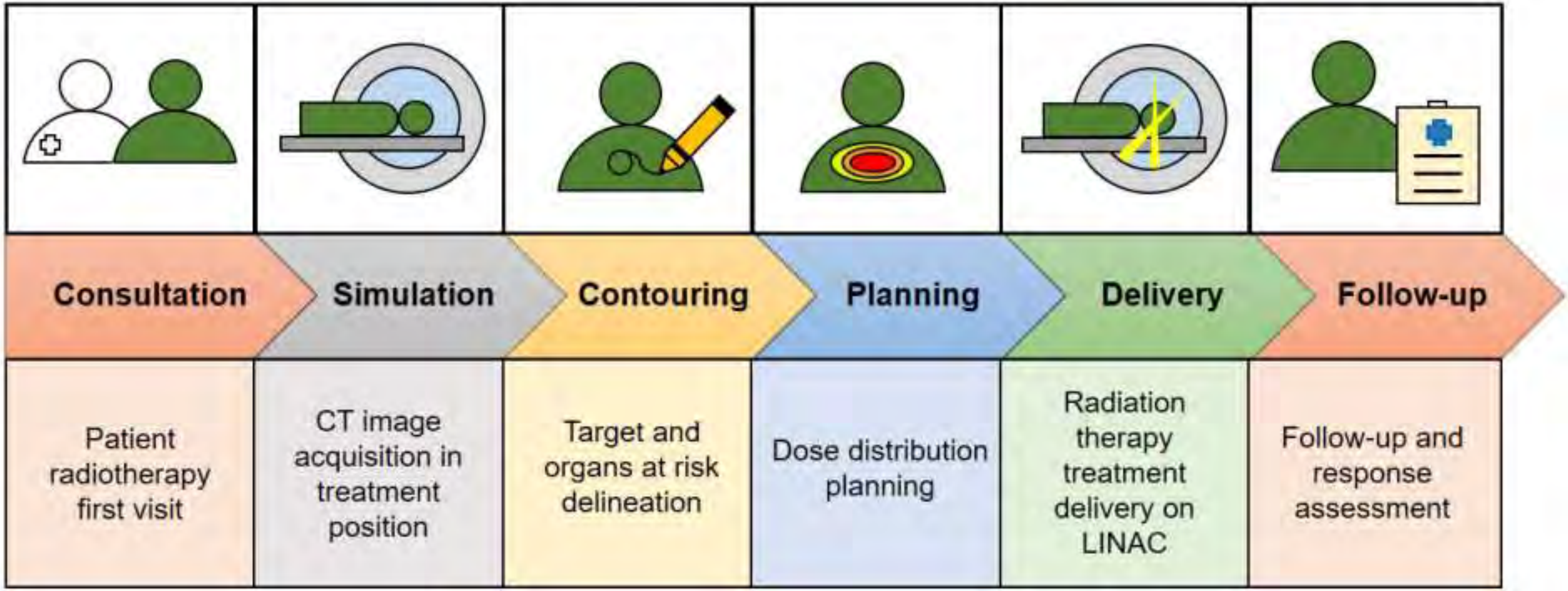

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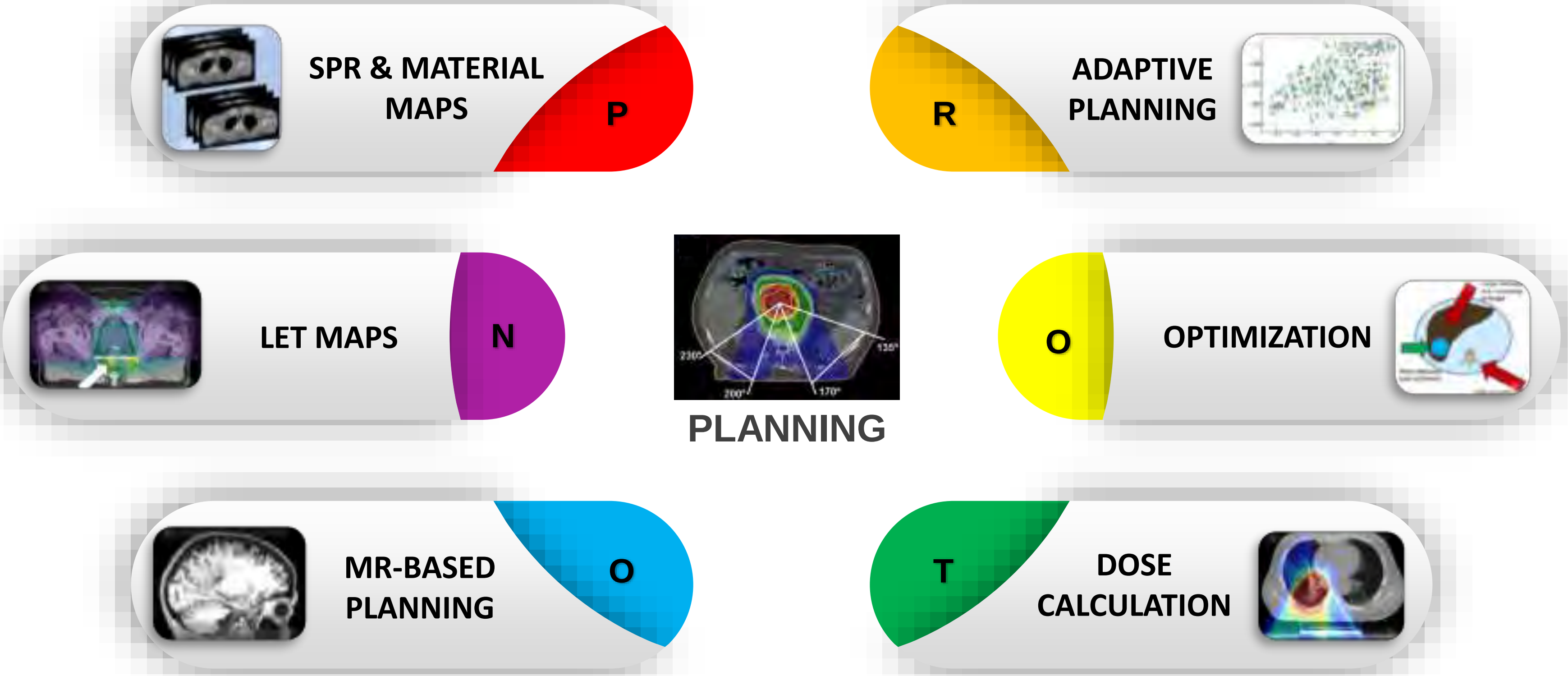
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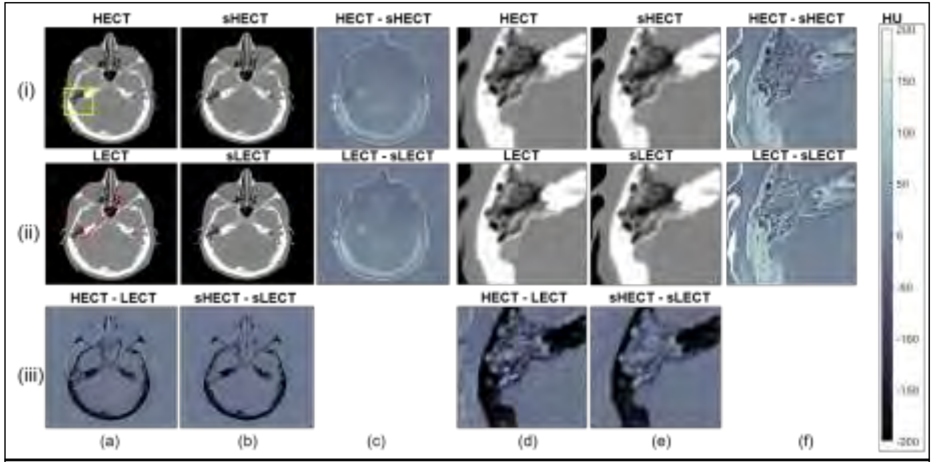

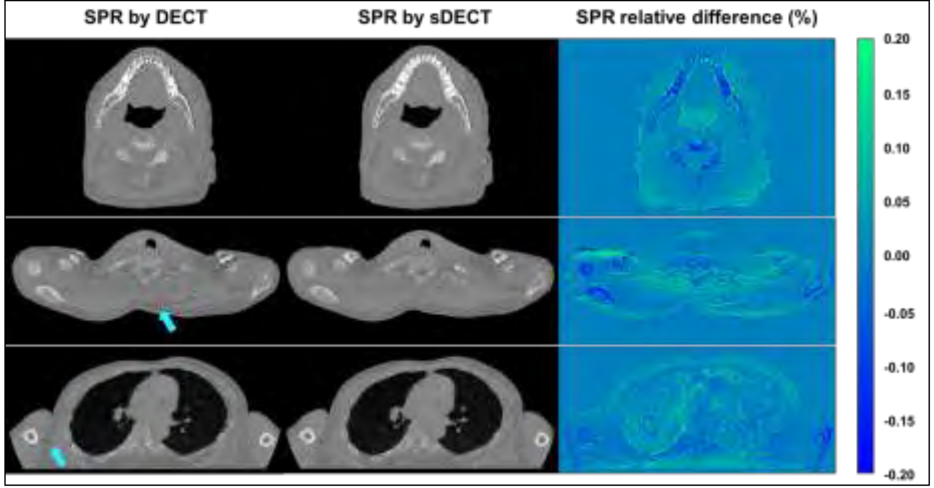

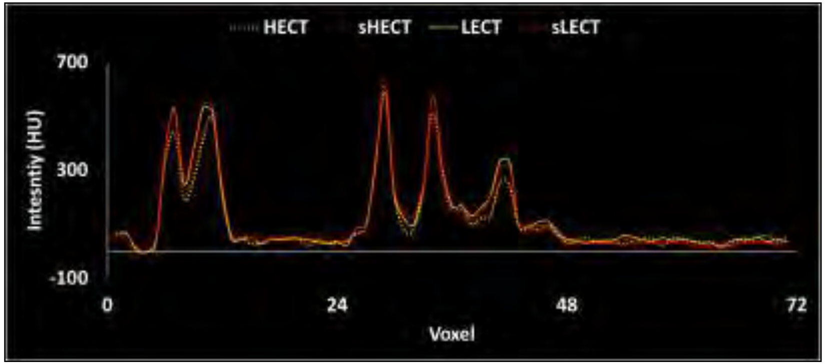

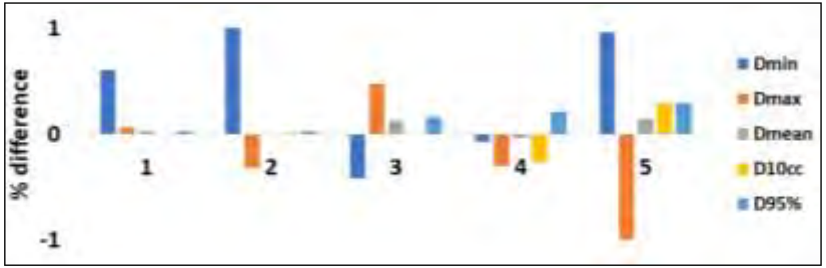

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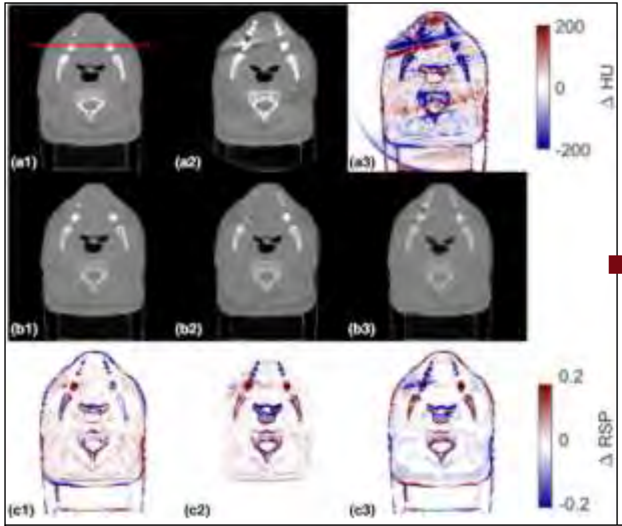

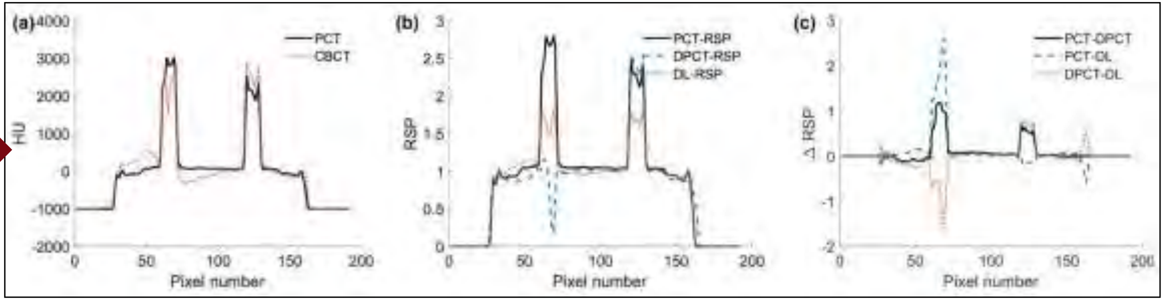

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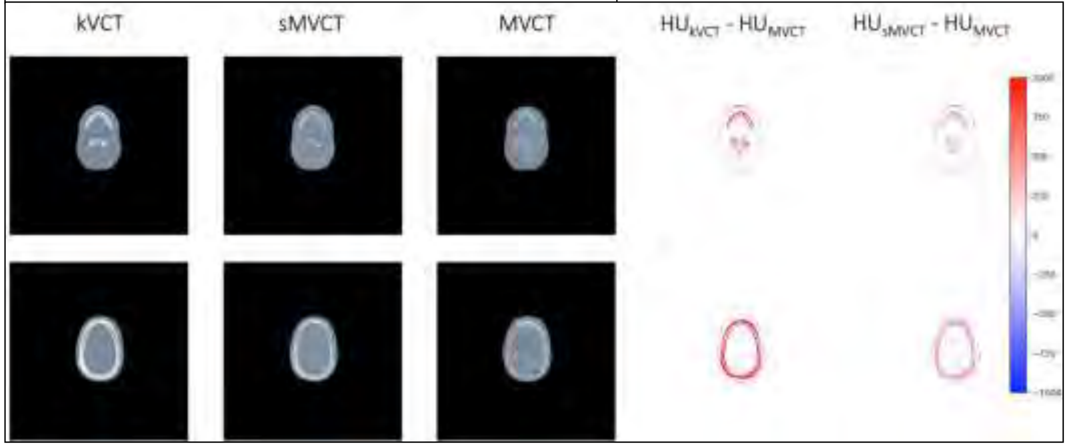

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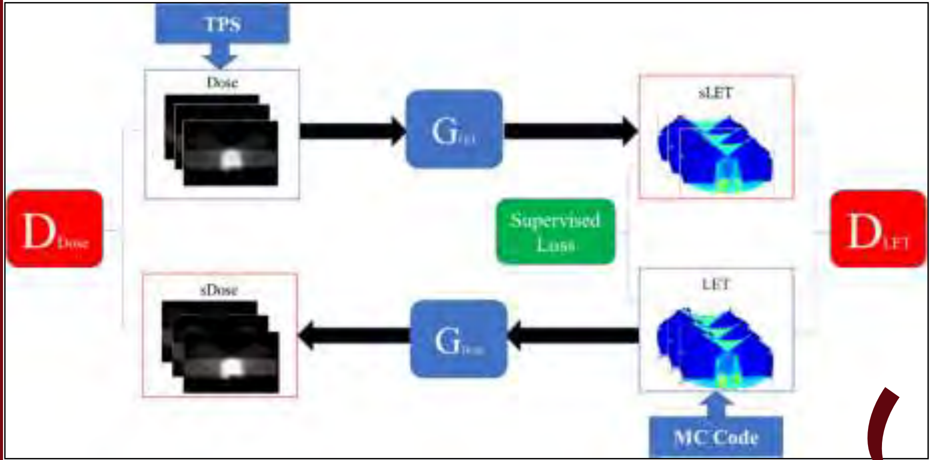
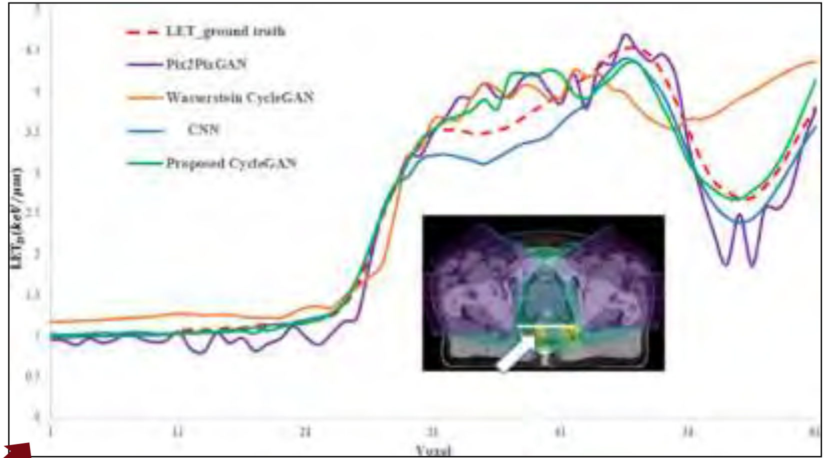
LET MAPS





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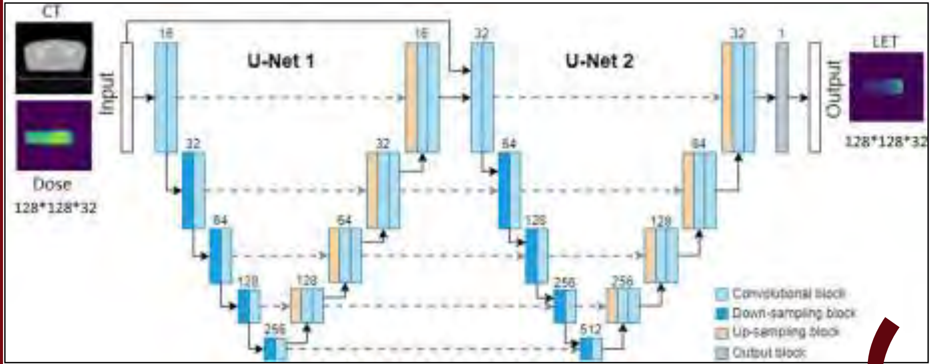

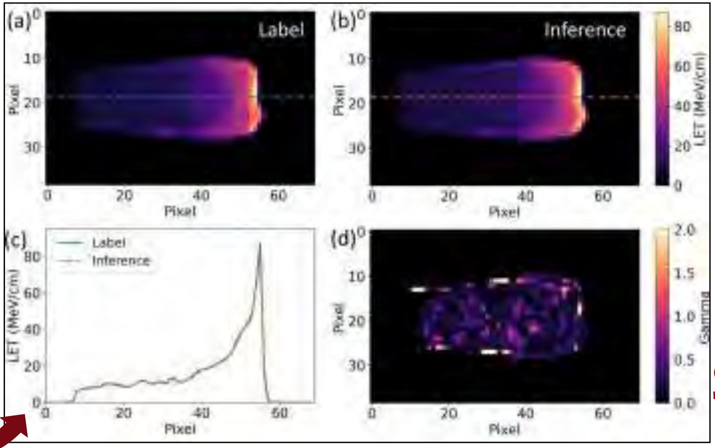

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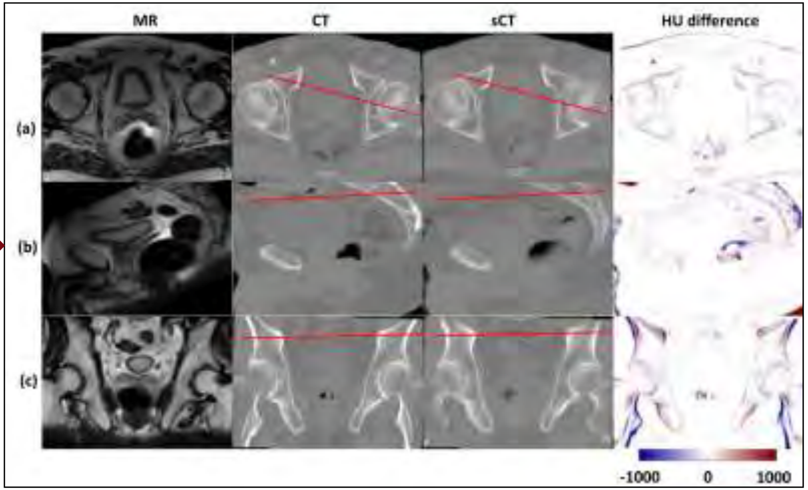
MR-BASED PLANNING



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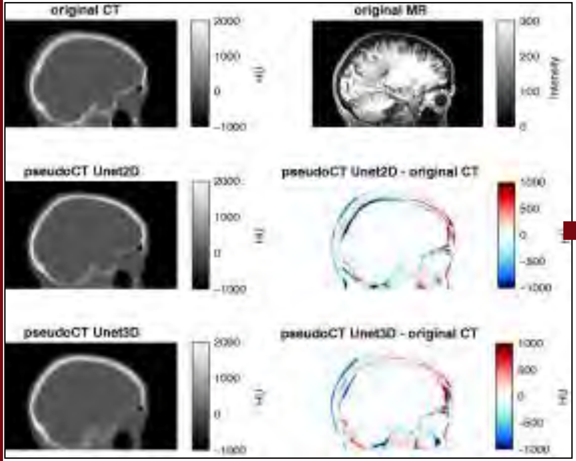

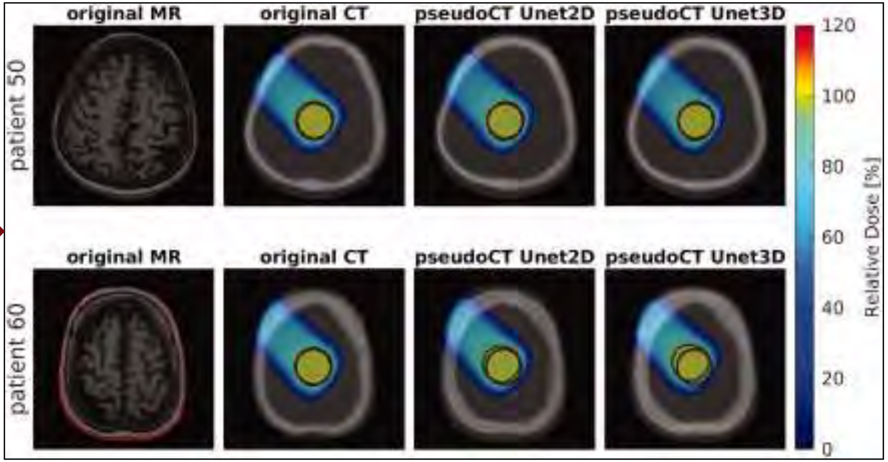

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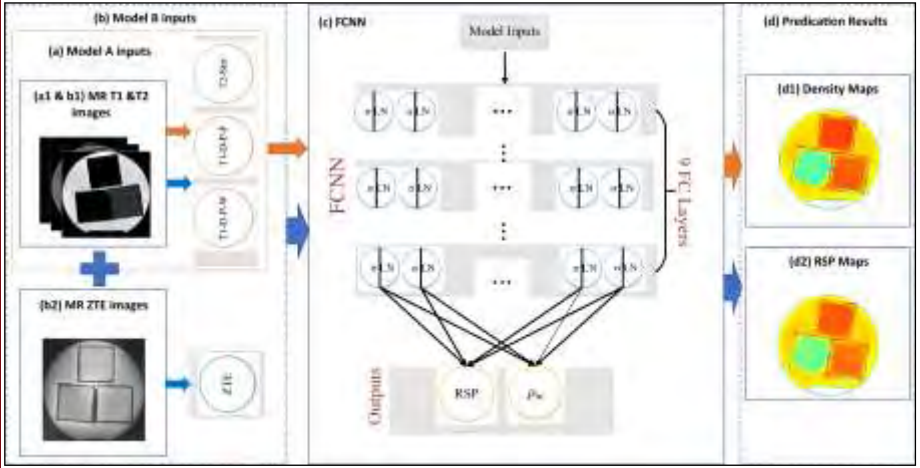

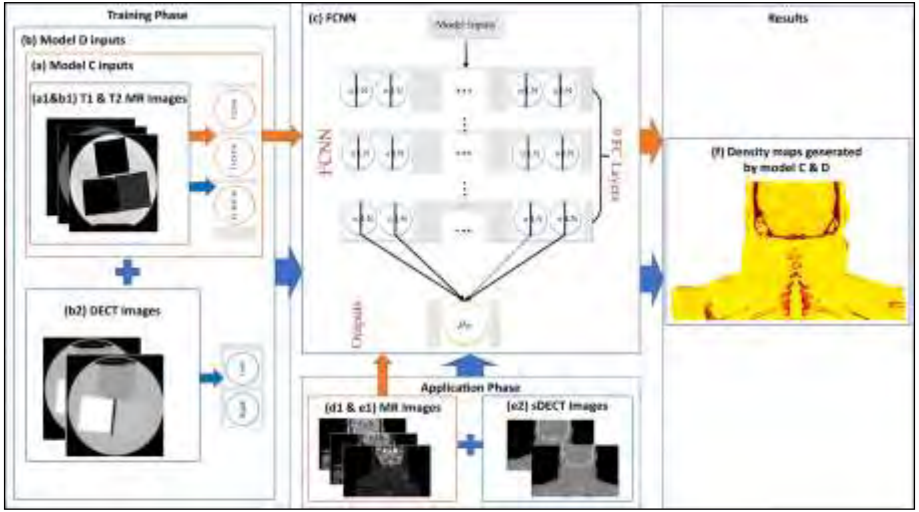

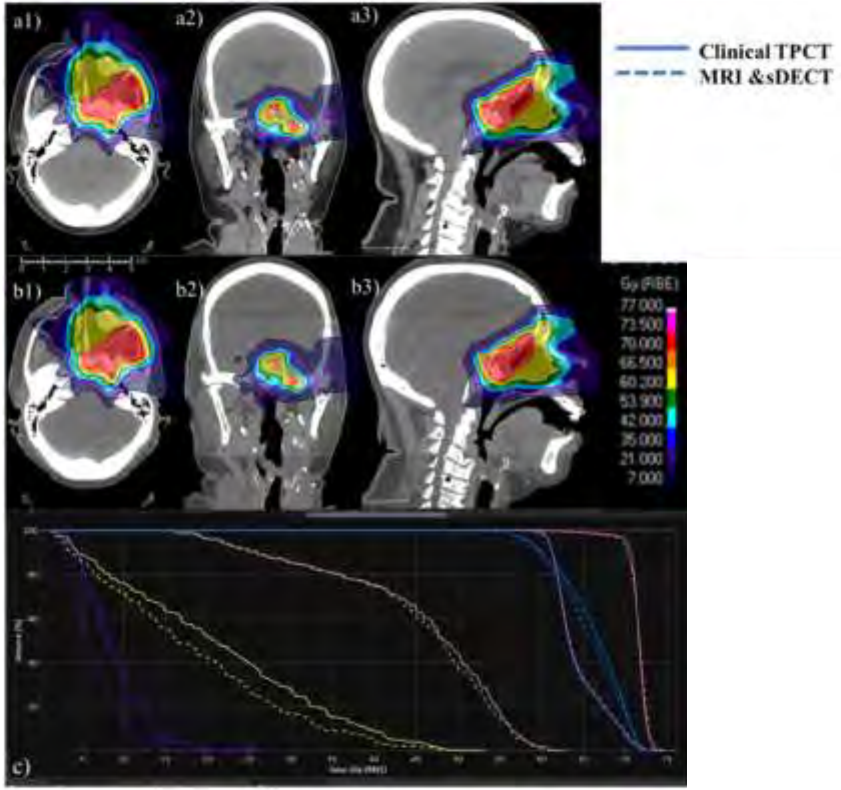

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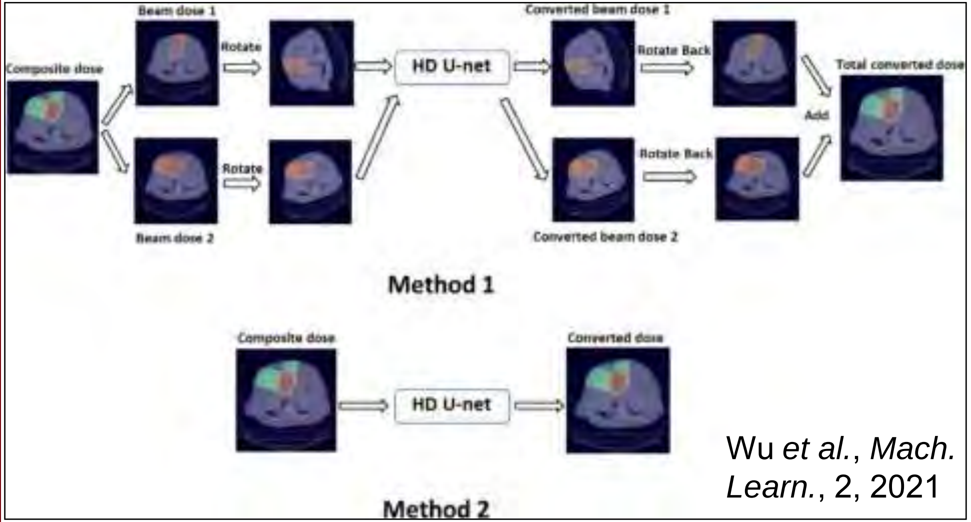
DOSE CALCULATION



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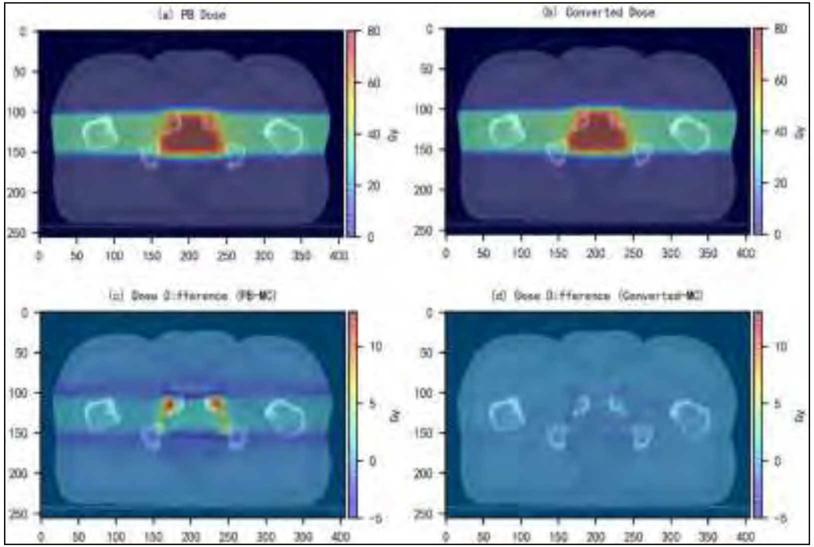

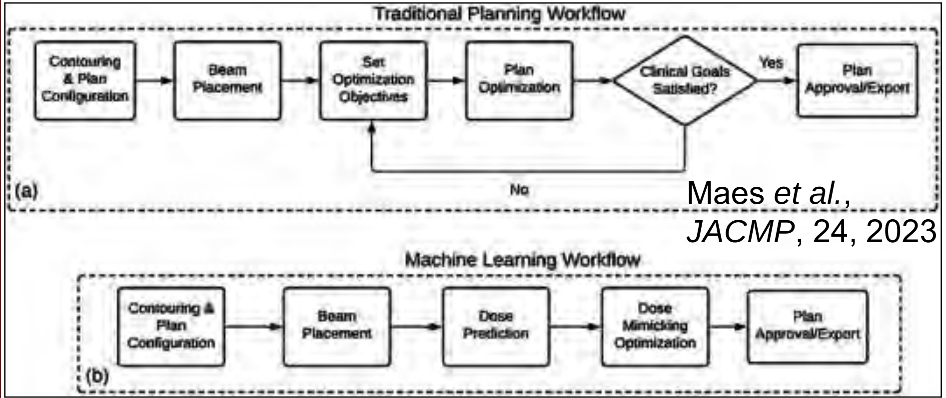

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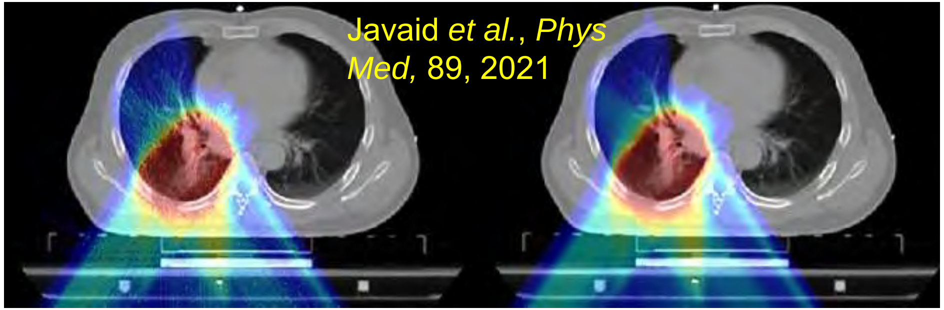

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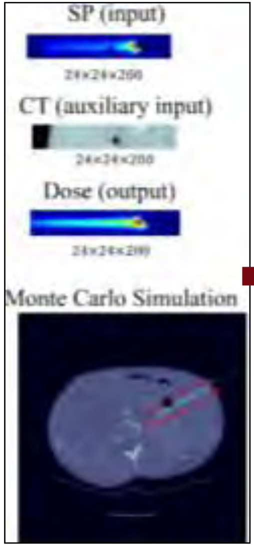

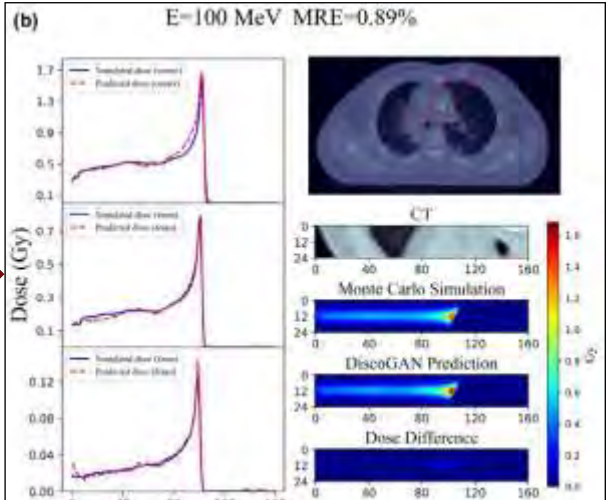

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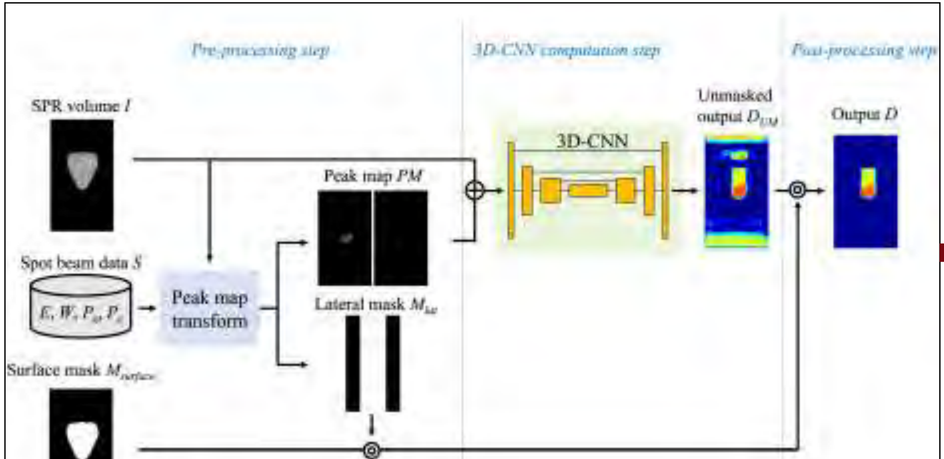

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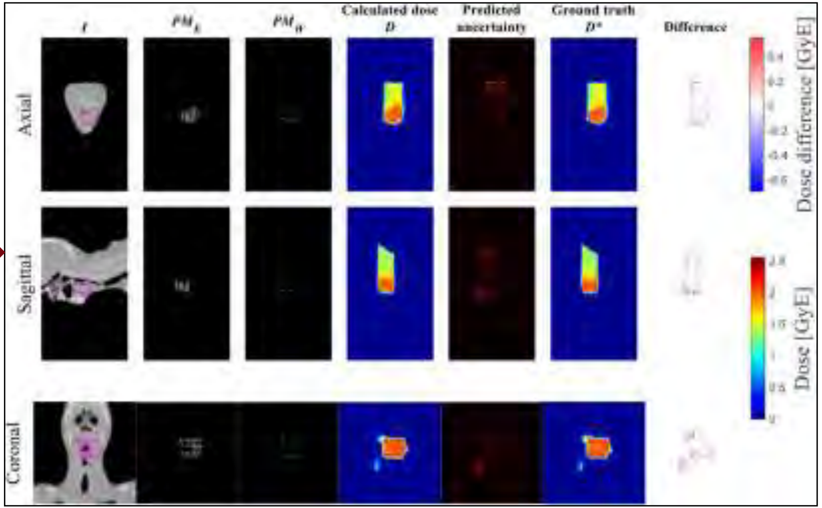

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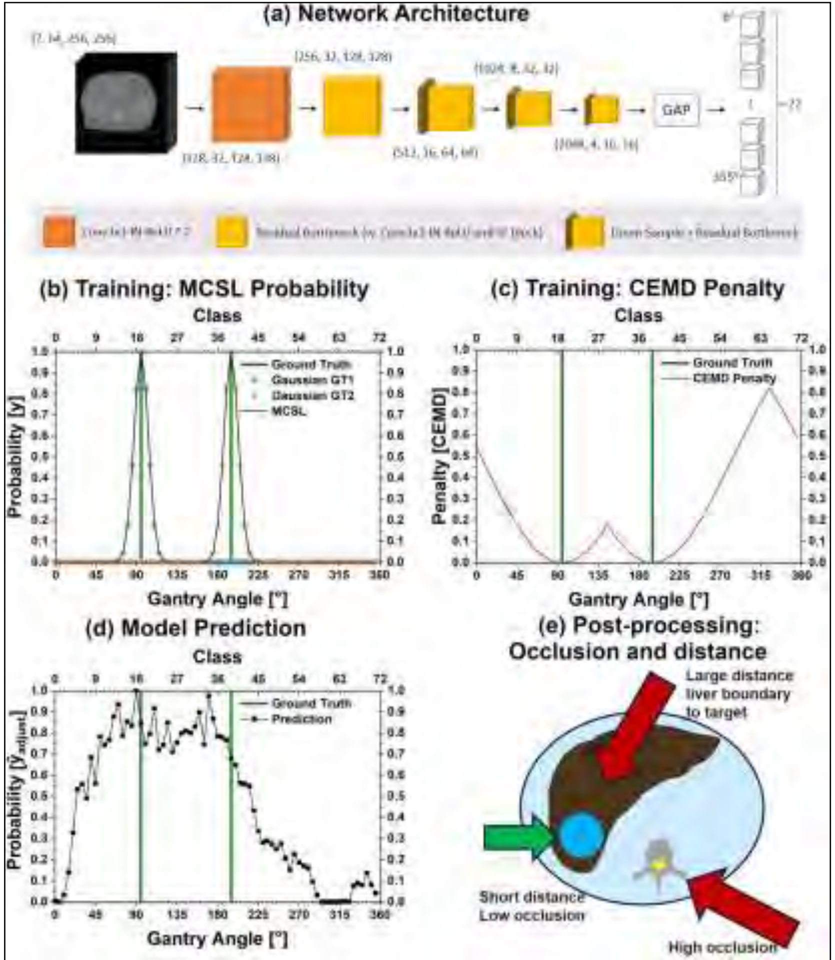
OPTIMIZATION



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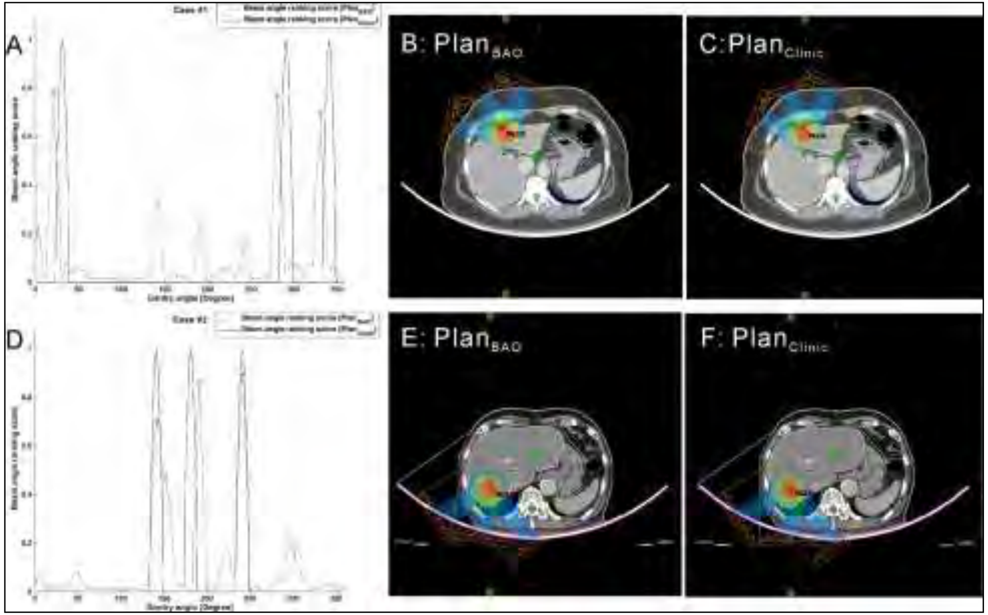

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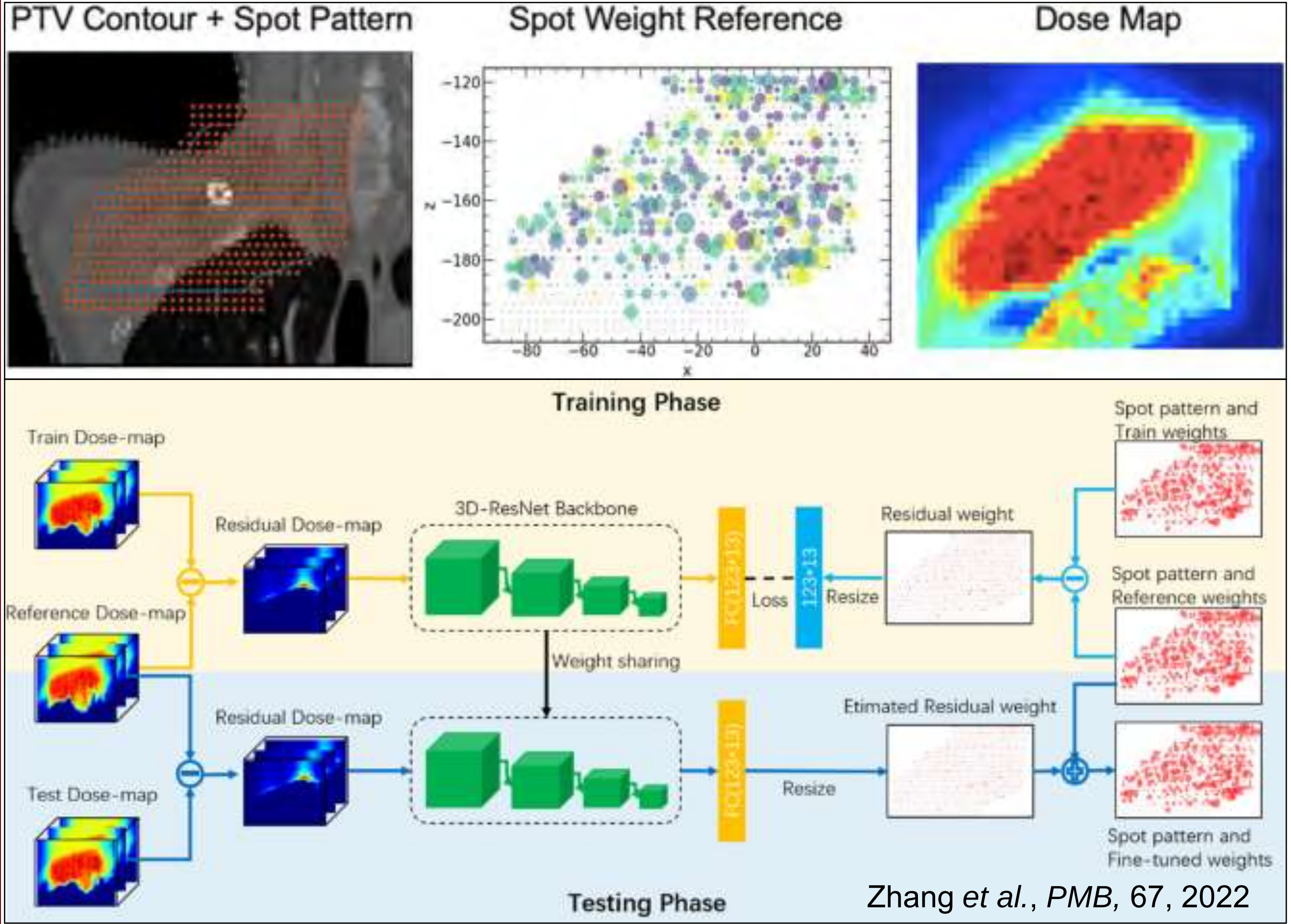
ADAPTIVE PLANNING



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DELIVERY

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QUALITY ASSURANCE

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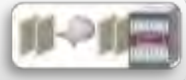
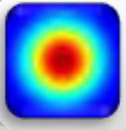
PROTON TOMOGRAPHY





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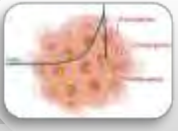
PROTON RADIOGRAPHY



RANGE VERIFICATION

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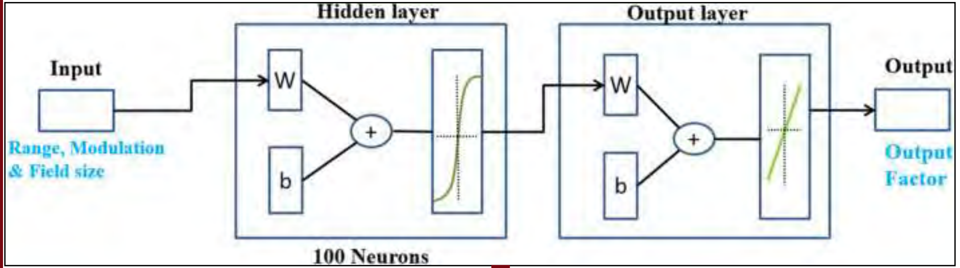
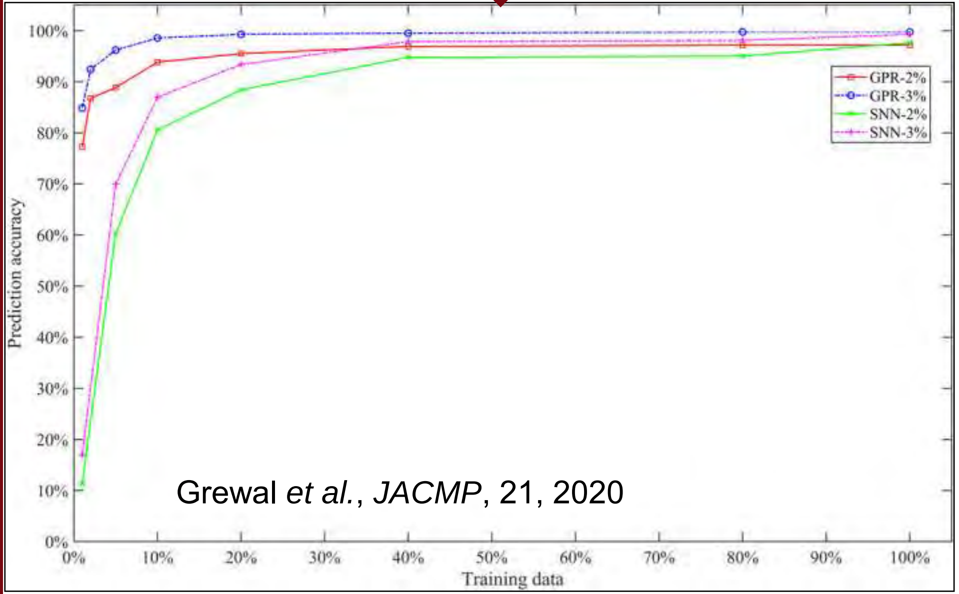
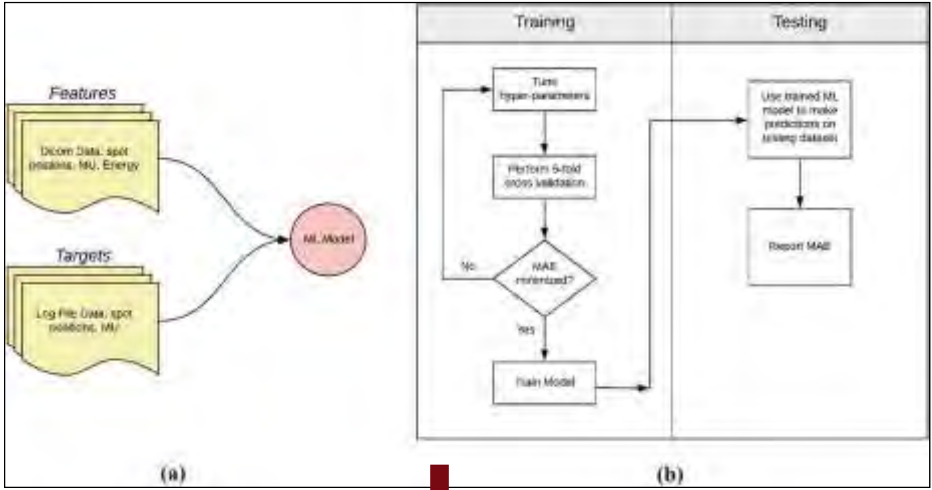
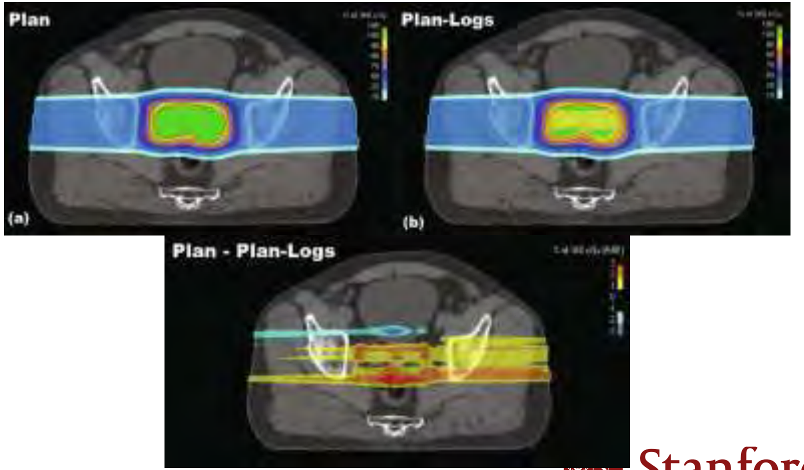
QA & DOSIMETRY





Grewal *et al.*, *JACMP*, 21, 2020





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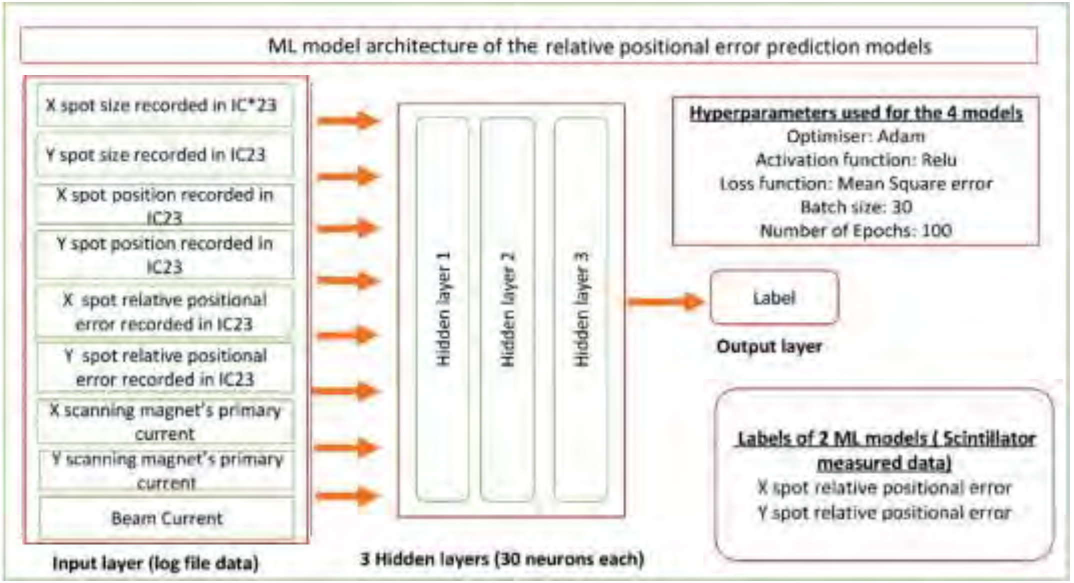

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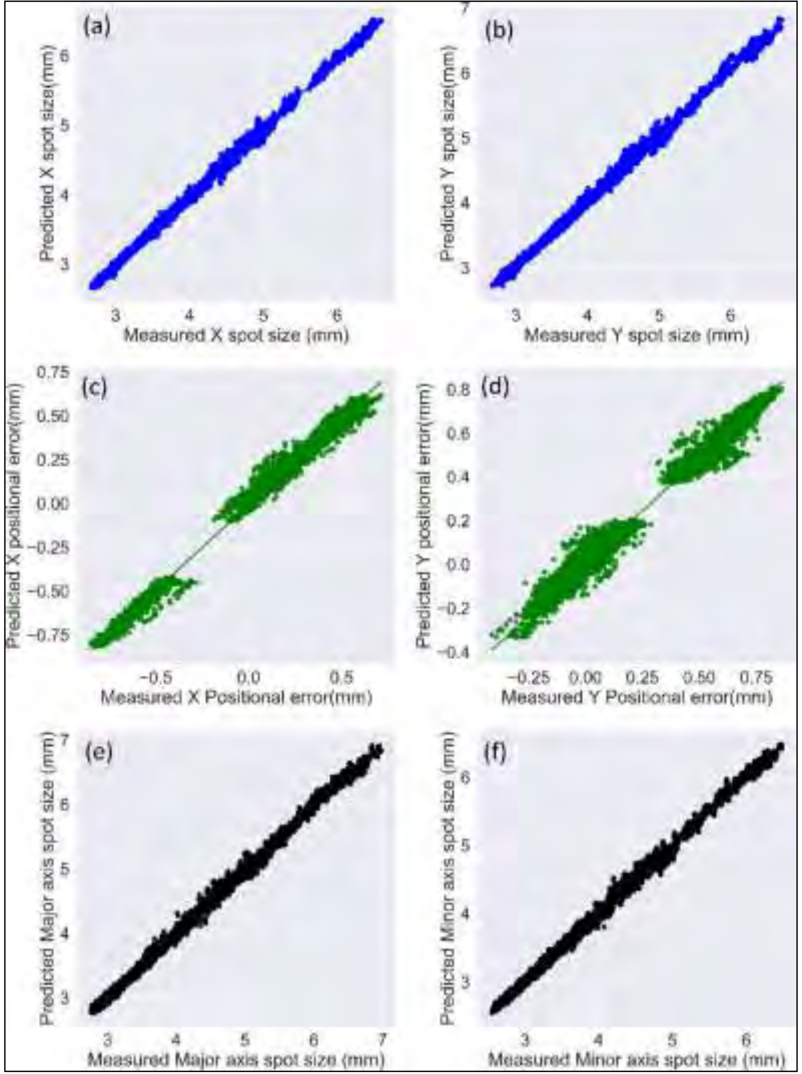

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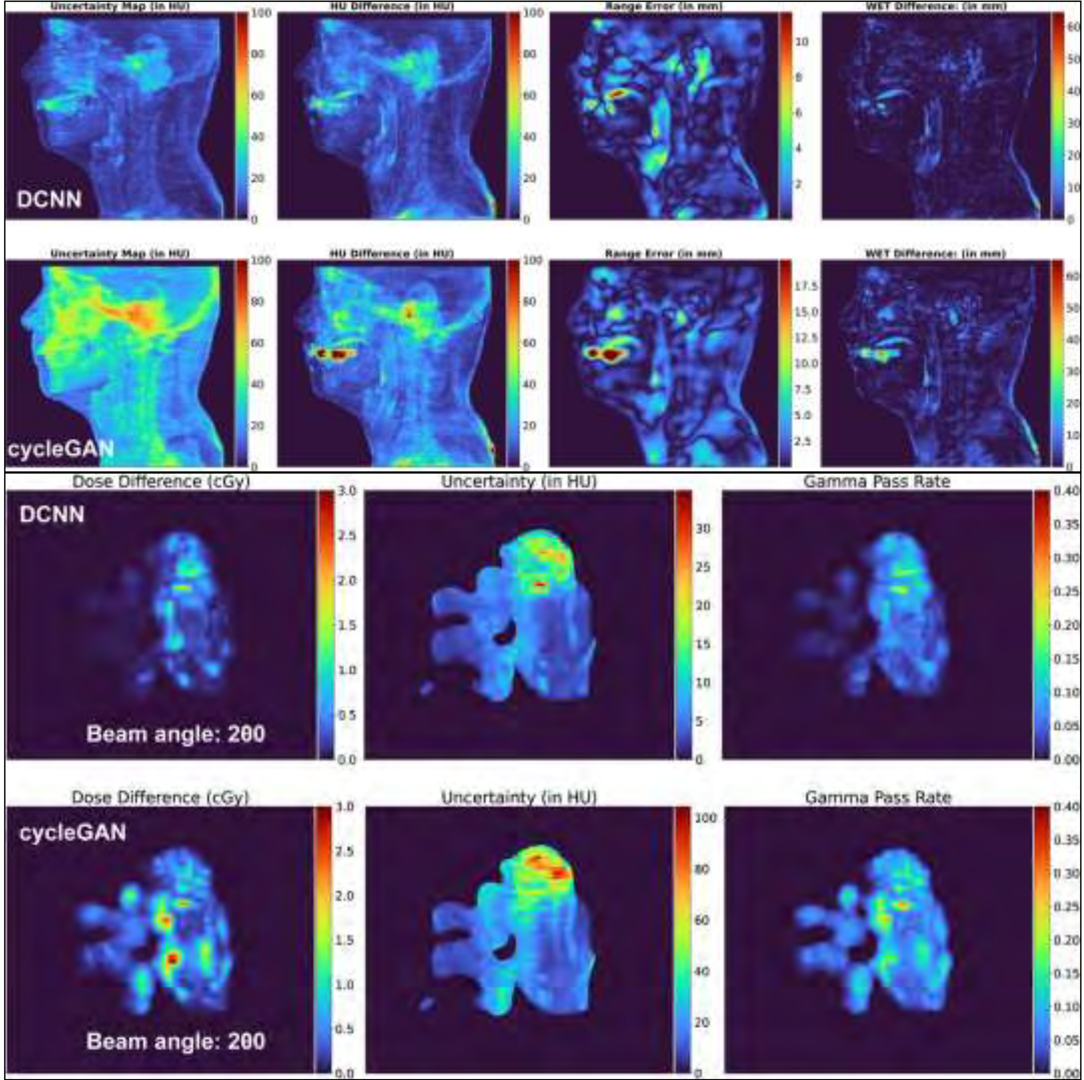

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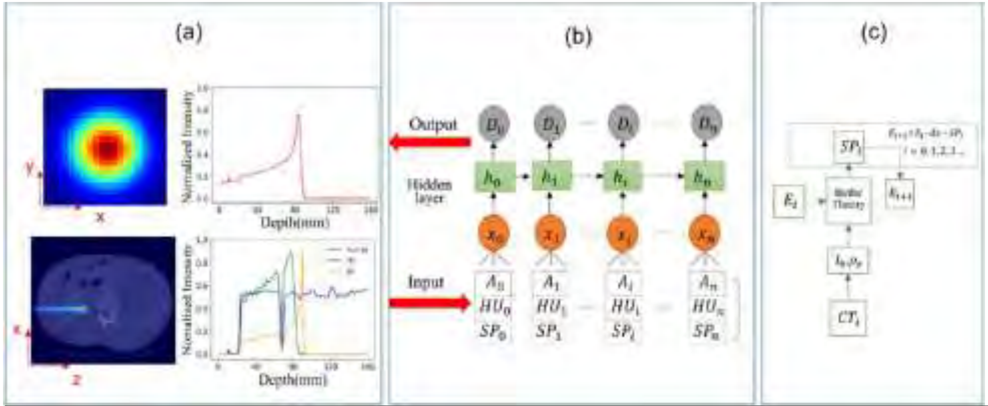
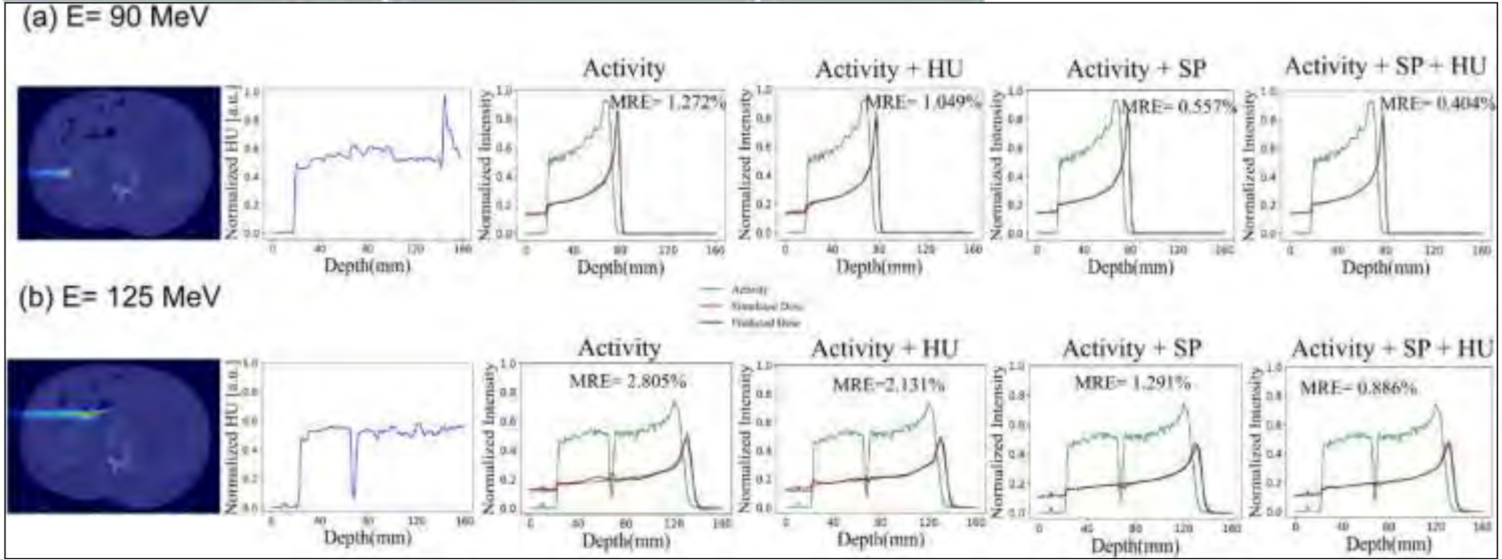


Hu *et al.*, *PMB*, 65, 2020



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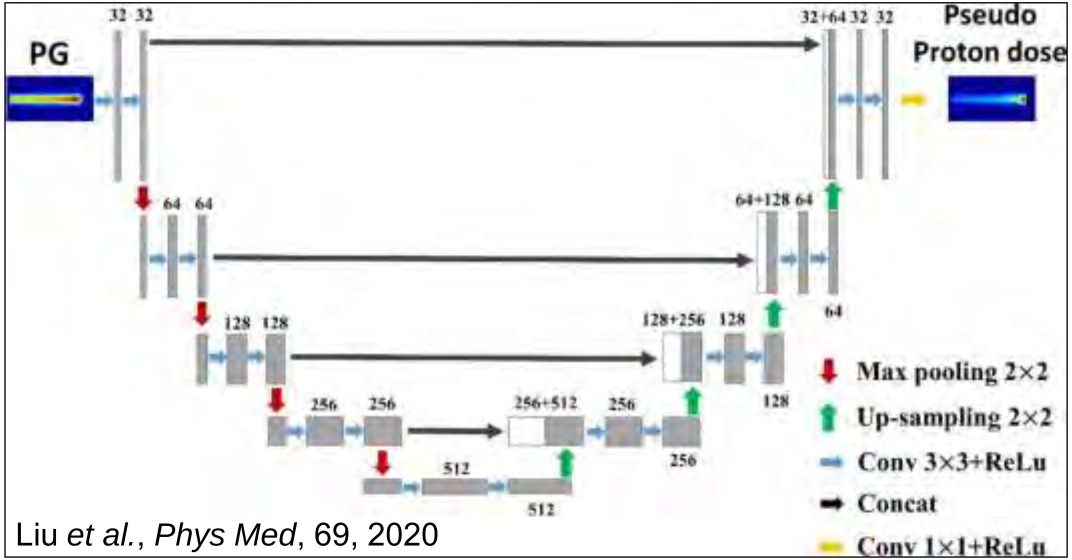

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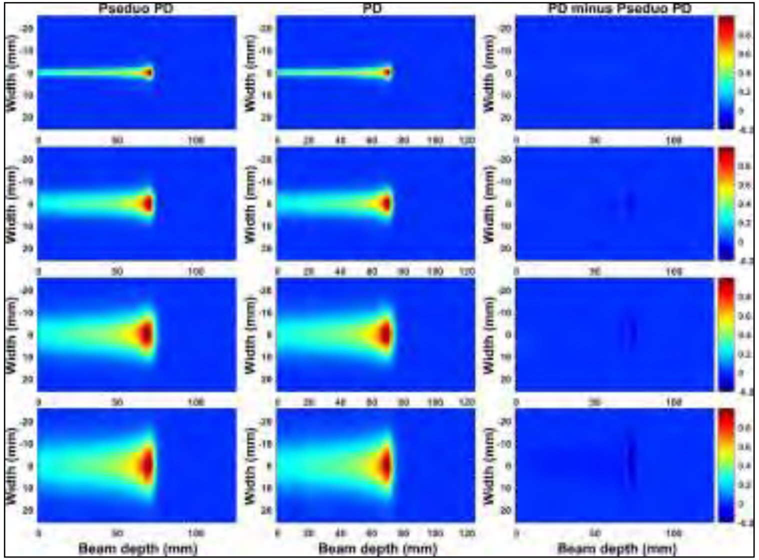

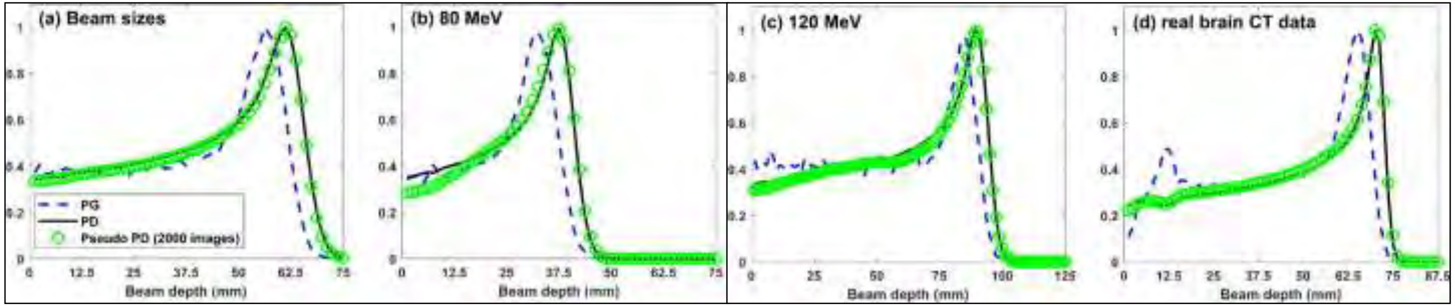

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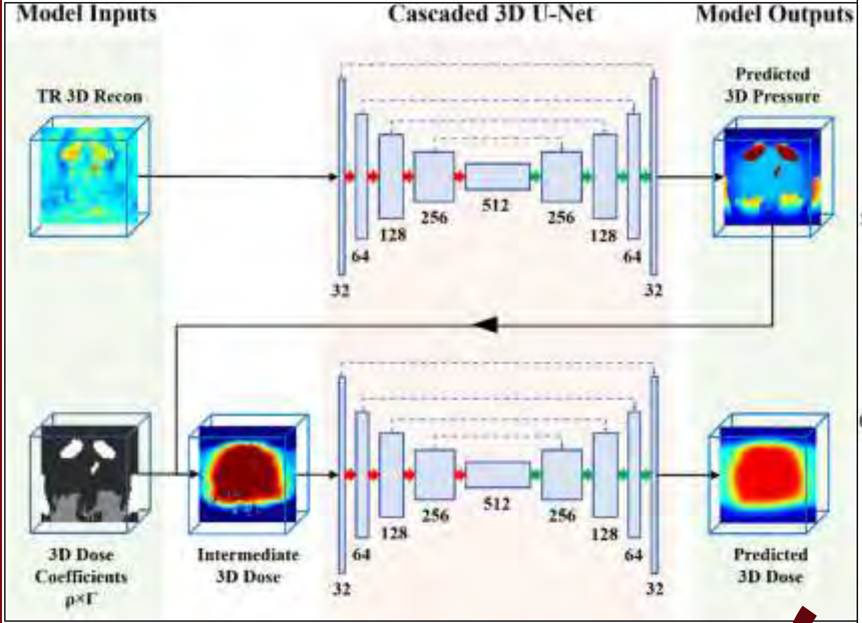

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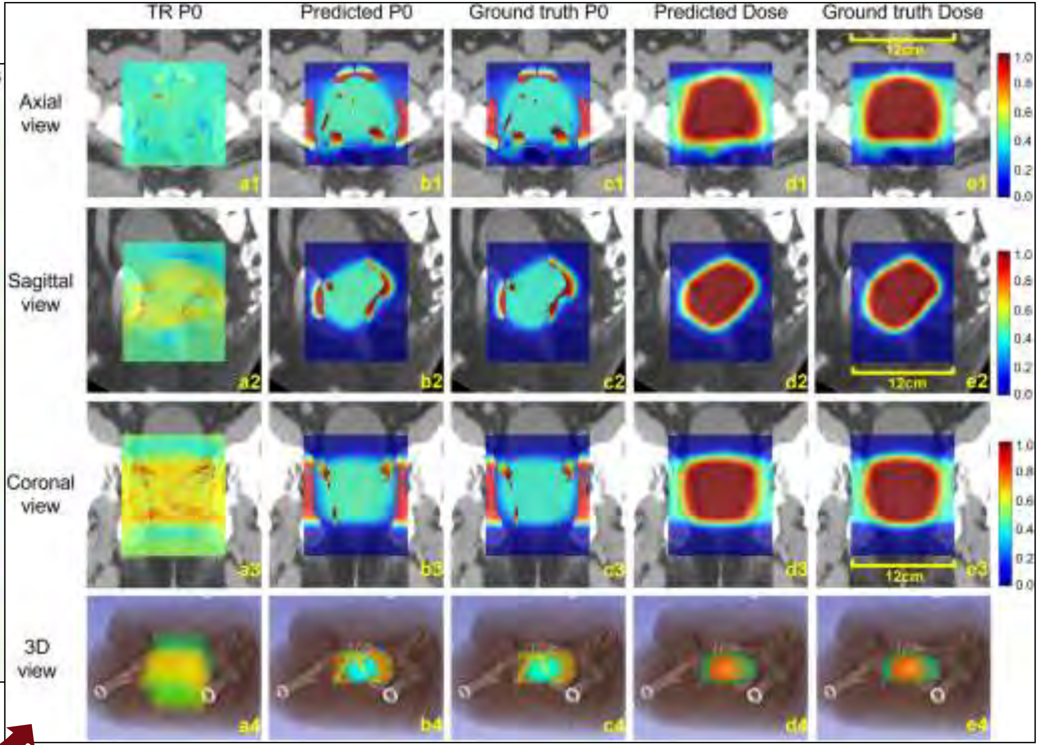

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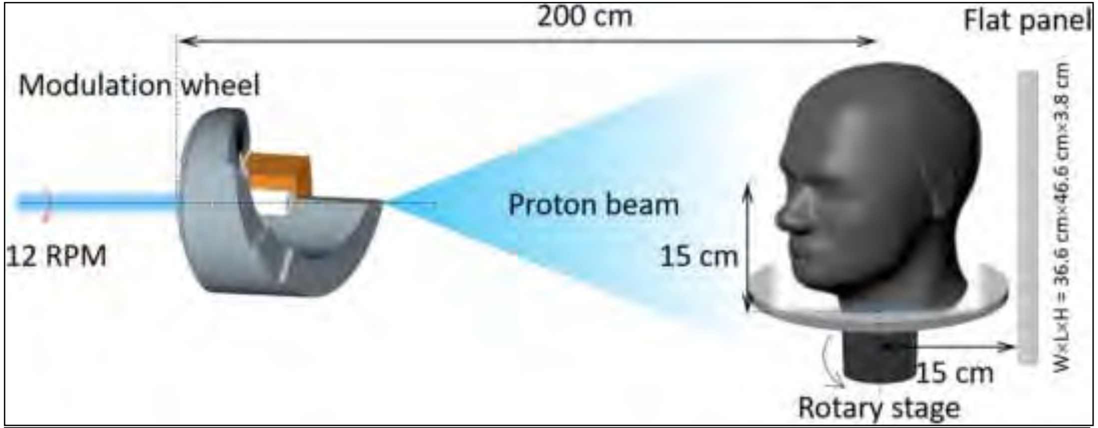

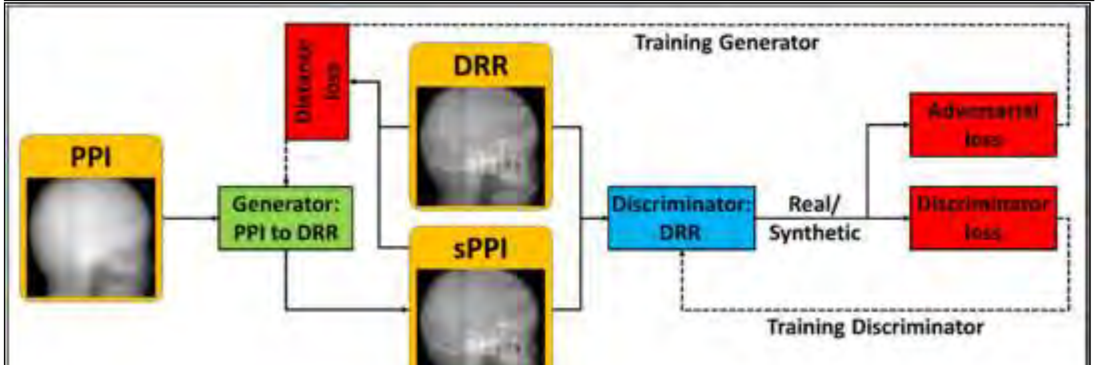

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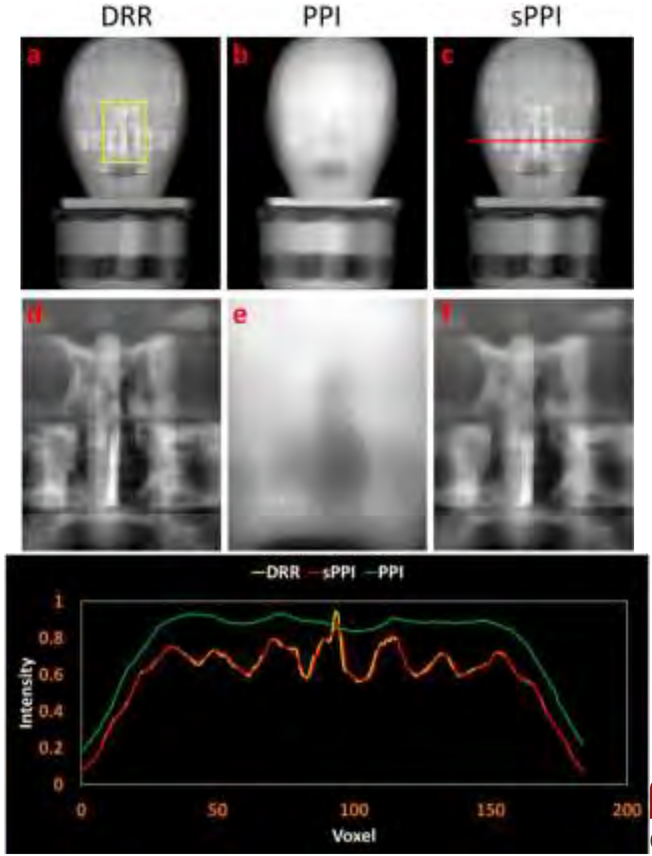

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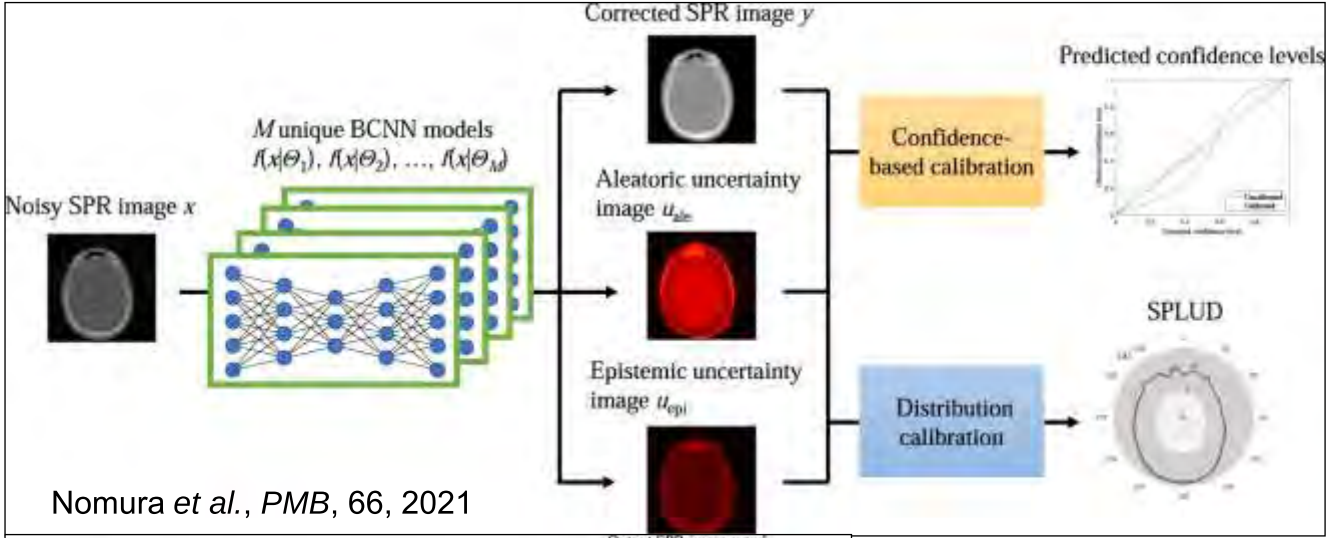

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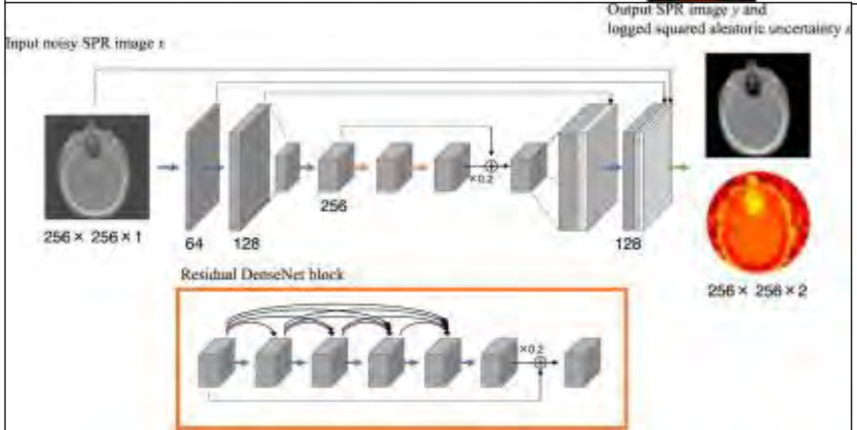

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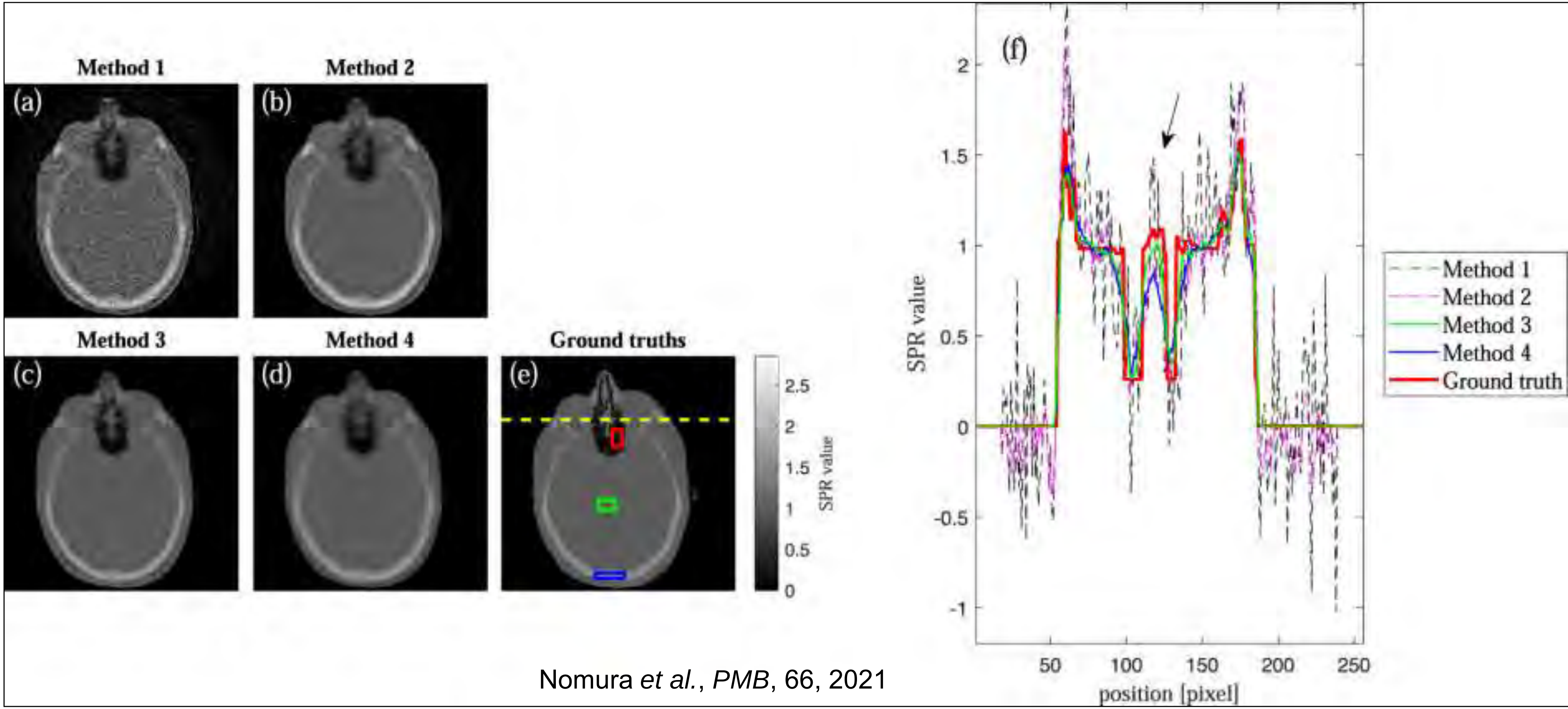

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CONCLUSIONS

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5 CONCLUSIONS

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- We are in a golden age of progress in the field of AI.

- Proton therapy is perfectly suited to benefit from AI to enhance accuracy and efficiency.

- Specifically, AI can benefit during treatment planning; dose calculation; quality assurance; image guidance; and delivery.

- There are challenges and pitfalls.

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