Motion-resolved B1+ prediction using deep learning for real-time pTx pulse-design.

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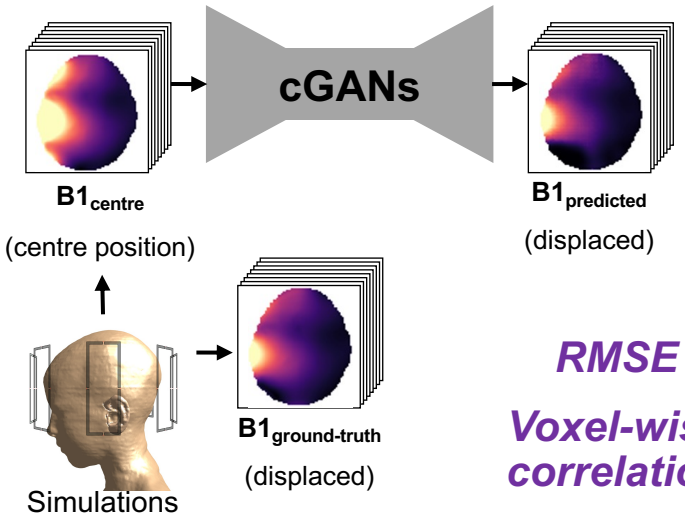
Background & Methods

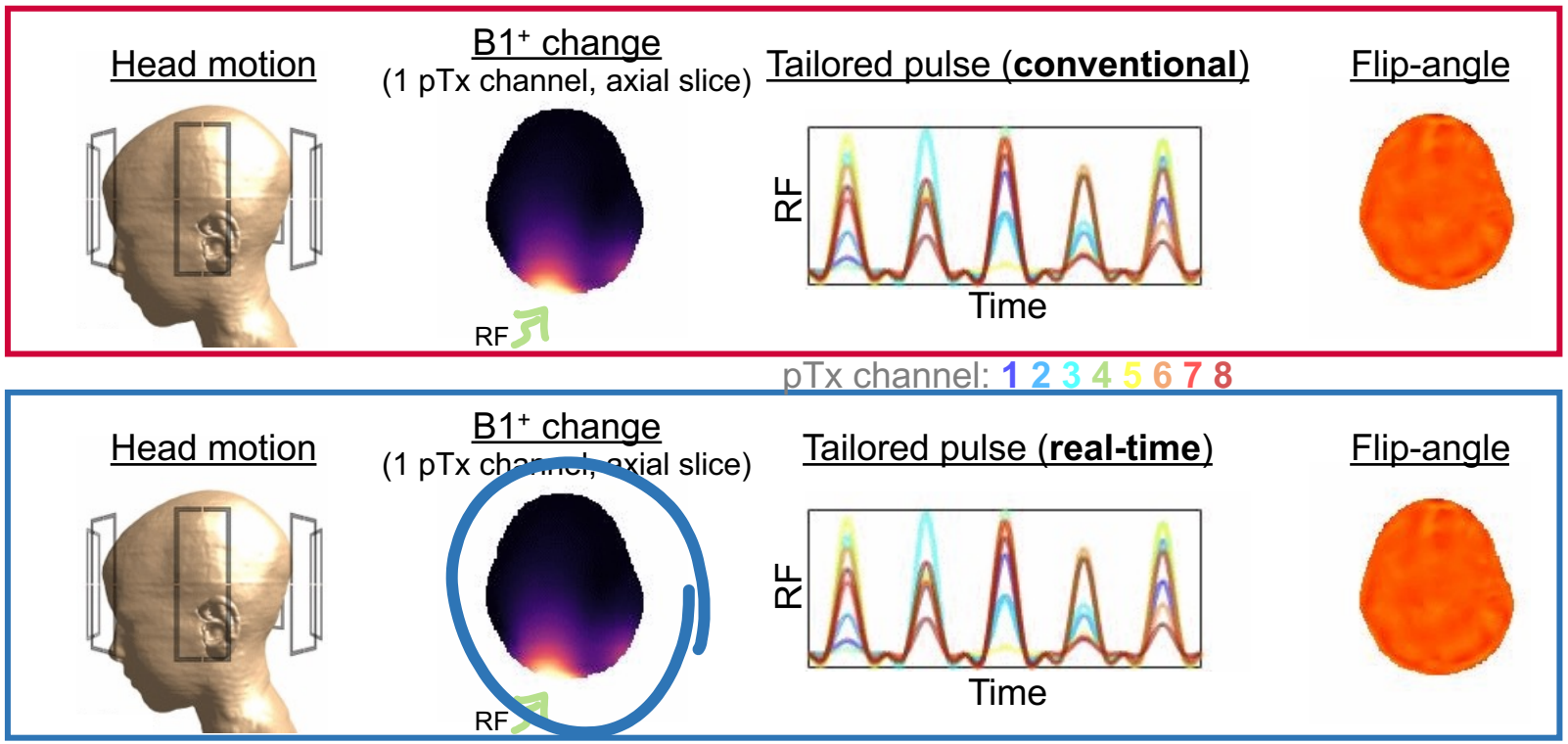
- 7T MRI – parallel transmission (**pTx**) [1]
- pTx pulses are **motion-sensitive** [2,3,4,5]
- Real-time pTx pulse re-design [6]
  - Requires **"real-time" B_1^+ maps…**
- Conditional Generative Adversarial Networks [7]

- **Sim4Life** pTx simulations (Zurich MedTech, Zurich)
  - **3 body models** (2 training + 1 validation) [8]
  - **30 head positions** each (axial displacements)



RMSE

Voxel-wise correlation



[1] U. Katscher and P. Bornert, *NMR Biomed,19 (3)*, 2006. **[2]** W. Grissom, et al. *Mag Res Med,* 2006. **[3]** E. Kopanoglu, et al. *Proc. Intl. Soc. Mag. Reson. Med. 27,* 2019. **[4]** N. Schön, et al. *Proc. Intl. Soc. Mag. Reson. Med. 28,* 2020. **[5]** E. Kopanoglu, et al. *Mag Res Med*, 2020. **[6]** E. Kopanoglu. *Proc. Intl. Soc. Mag. Reson. Med., 26*, 2018. **[7]** P. Isola et al. *CVPR,* 2018. arXiv:1611.07004v1 **[8]** M.C. Gosselin et al. *Phys. Med. Biol.(59)*, 2014.

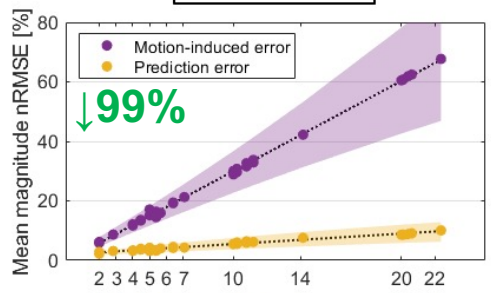
Results & Conclusions

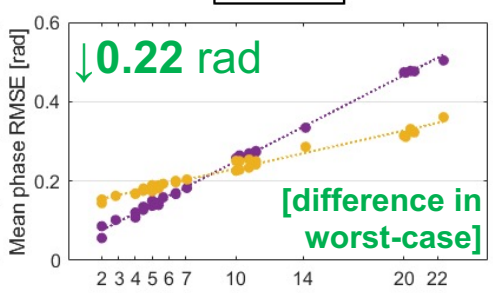
B_1^+

MAGNITUDE

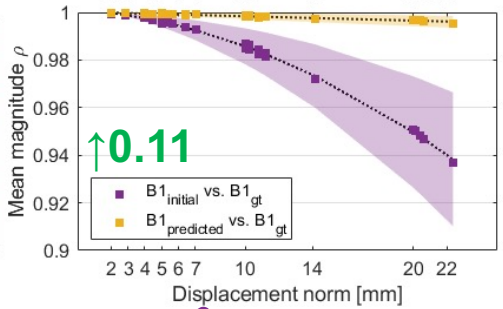
PHASE

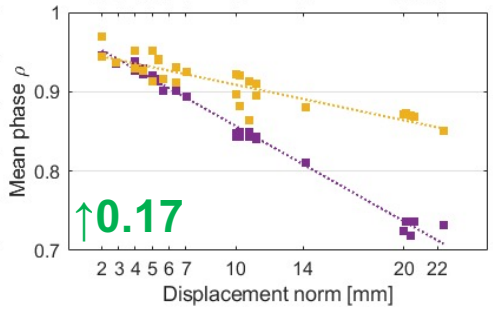
ERROR

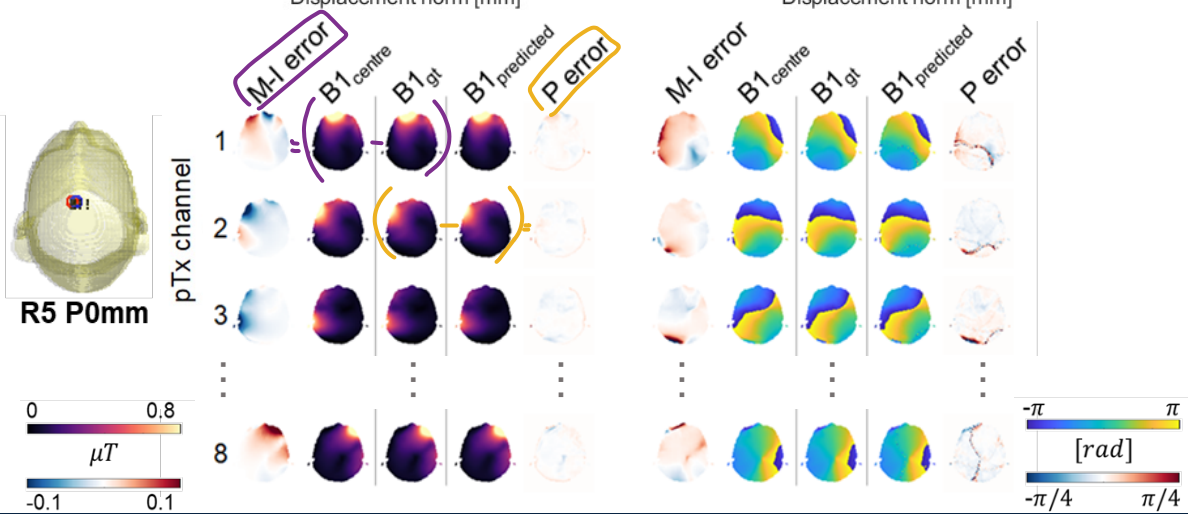




CORRELATION







Flip-angle