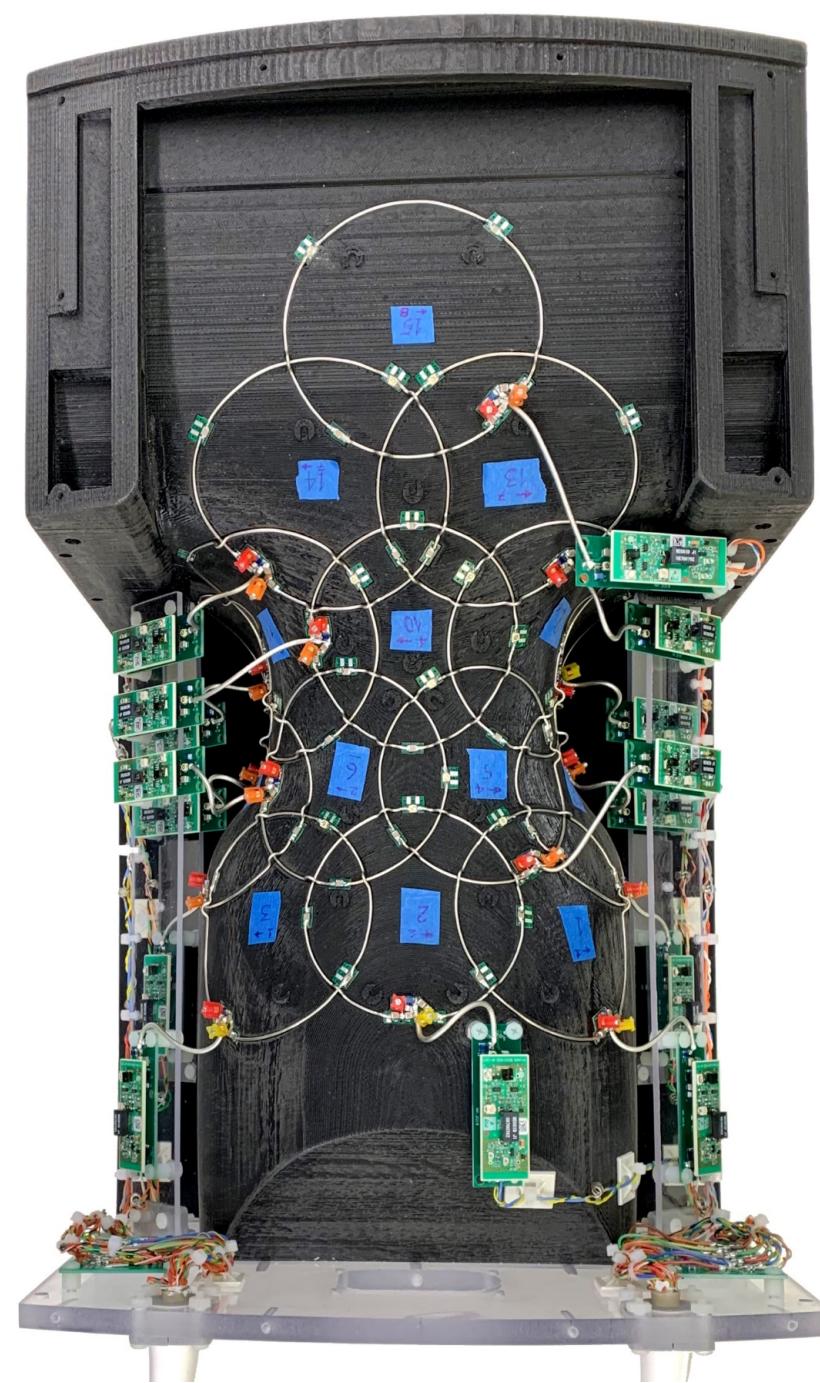
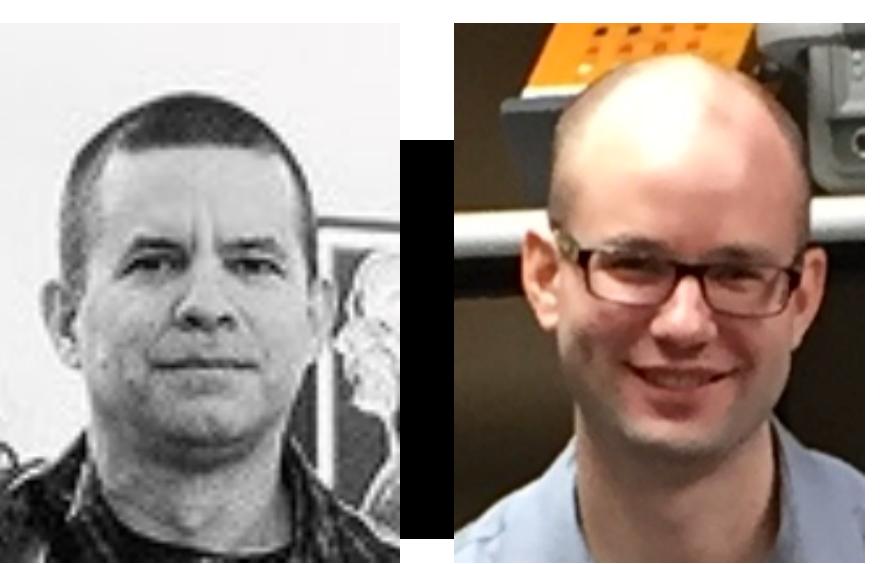


C-spine coil for 7T MRI(*)



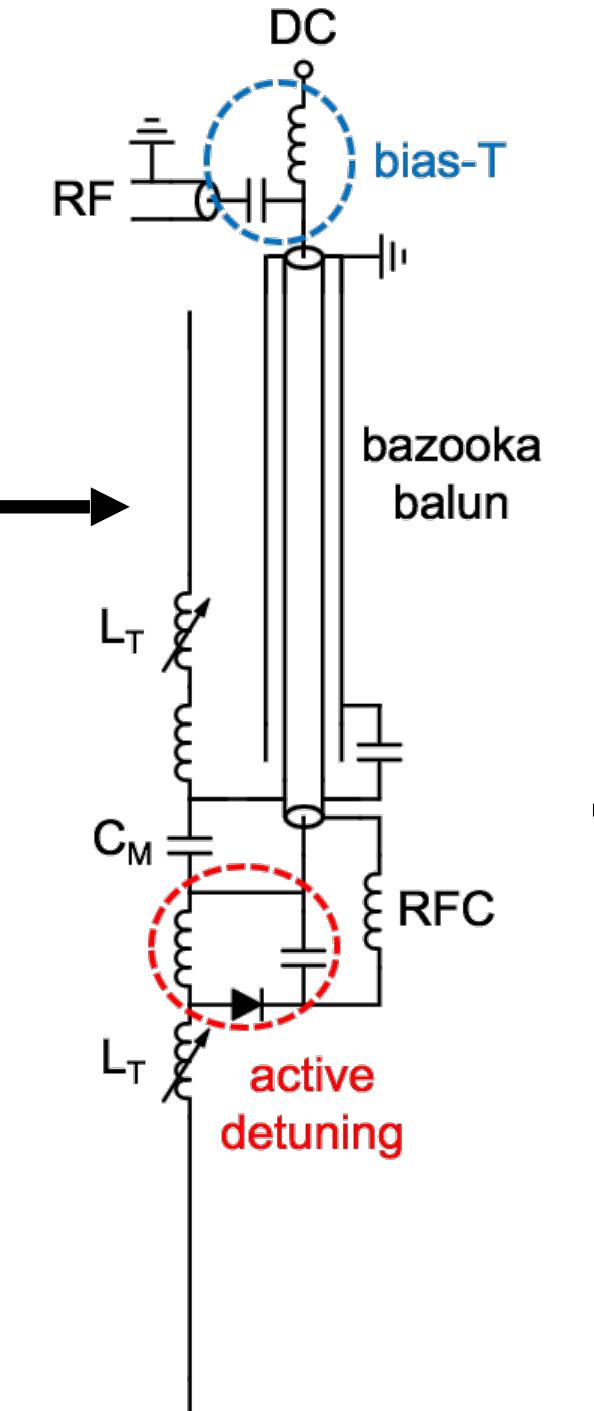
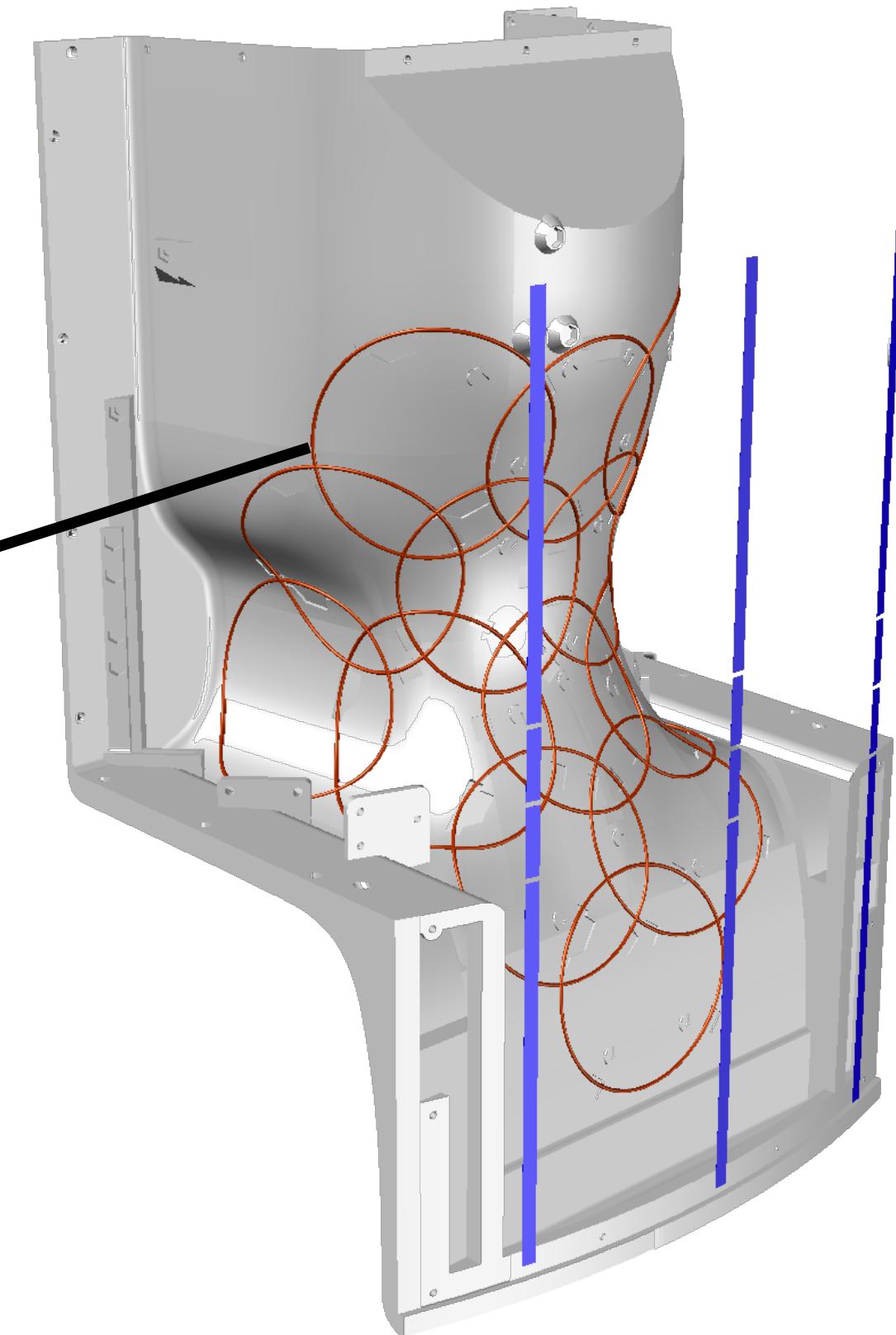
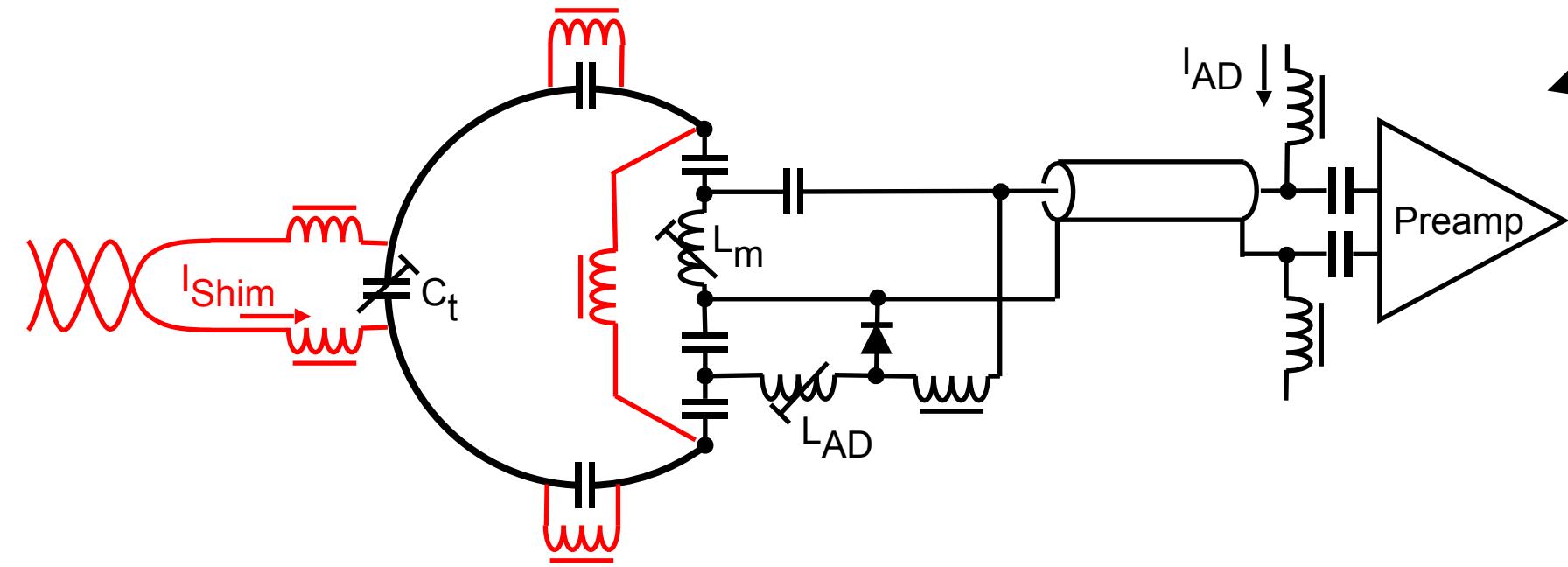
(*) Compatible with Siemens Terra system

Design



Rx coil

- 15 circular loops (radius: ~48mm).
- Geometric decoupling, tuning, matching and preamp decoupling adjusted by simulations.



Tx coil

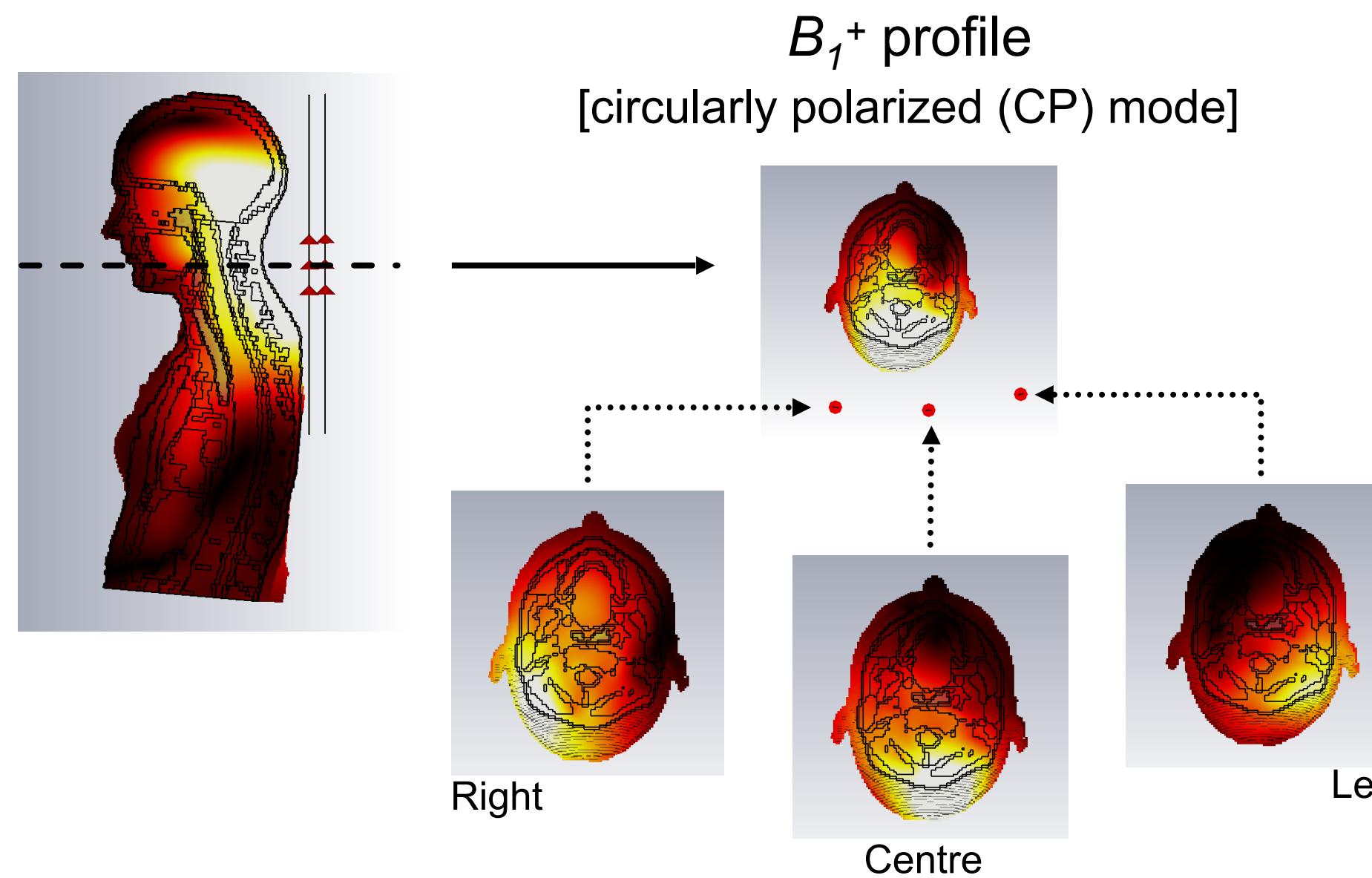
- 3 electric dipoles.
- Inductively shortened to resonate at 297MHz.
- Curved surface (radius: 50.6cm).

Shim components

- Will be added after RF tests.

Simulations

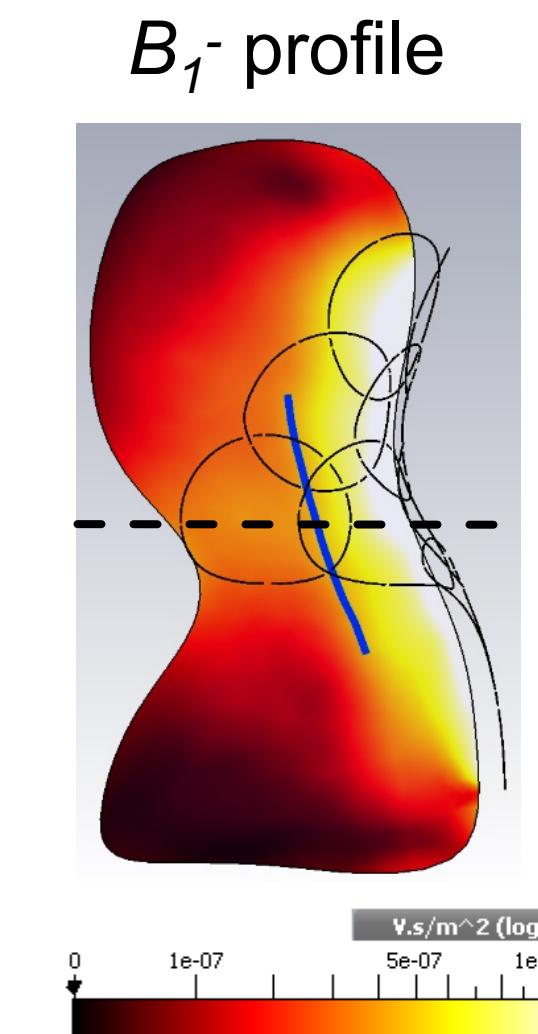
Tx coil



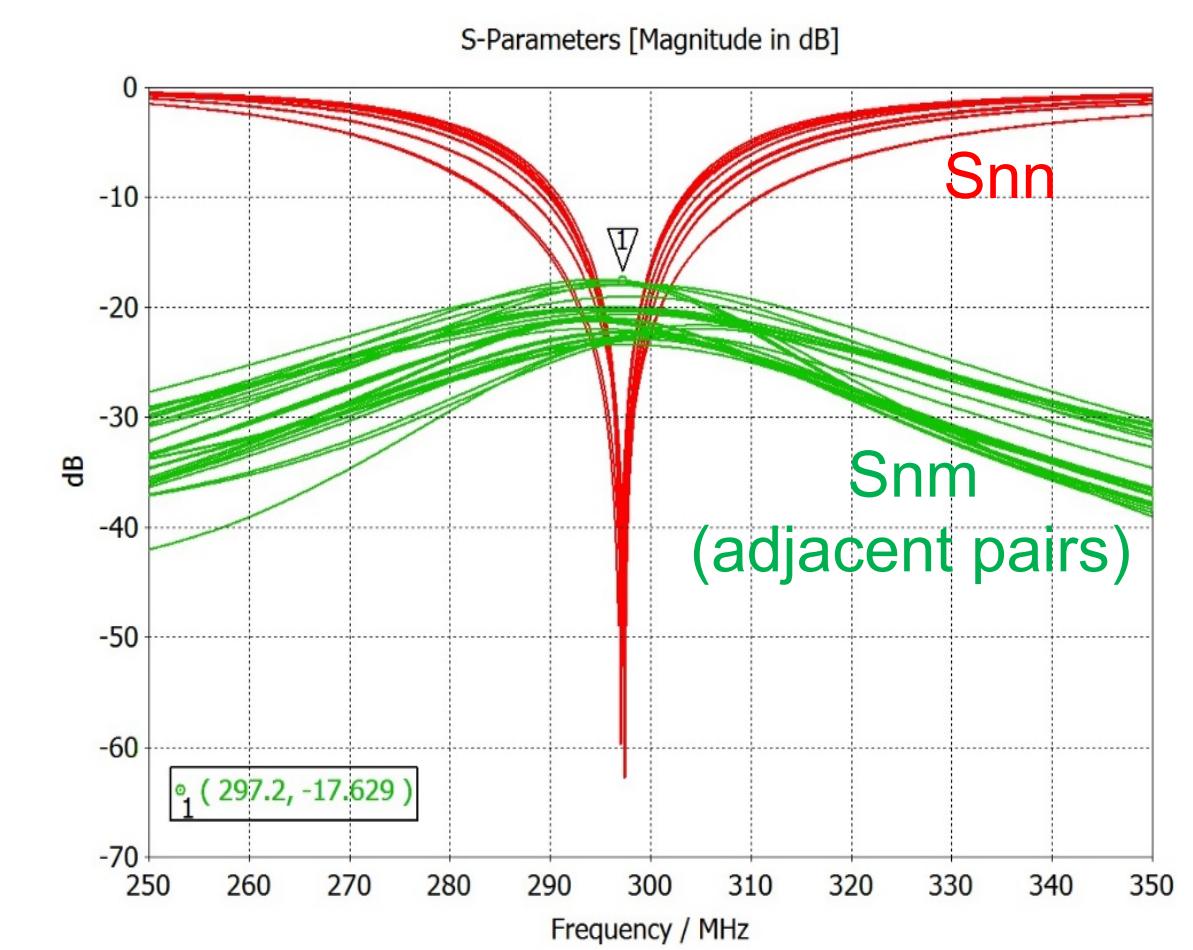
- Coupling (max, adjacent dipoles): -10dB.
- Efficiency increased 18% (array vs. center dipole).
- ~50% variation (occipital lobe to T4).
- Uniformity and SAR efficiency adjustable through B_1^+ shimming.

Rx coil

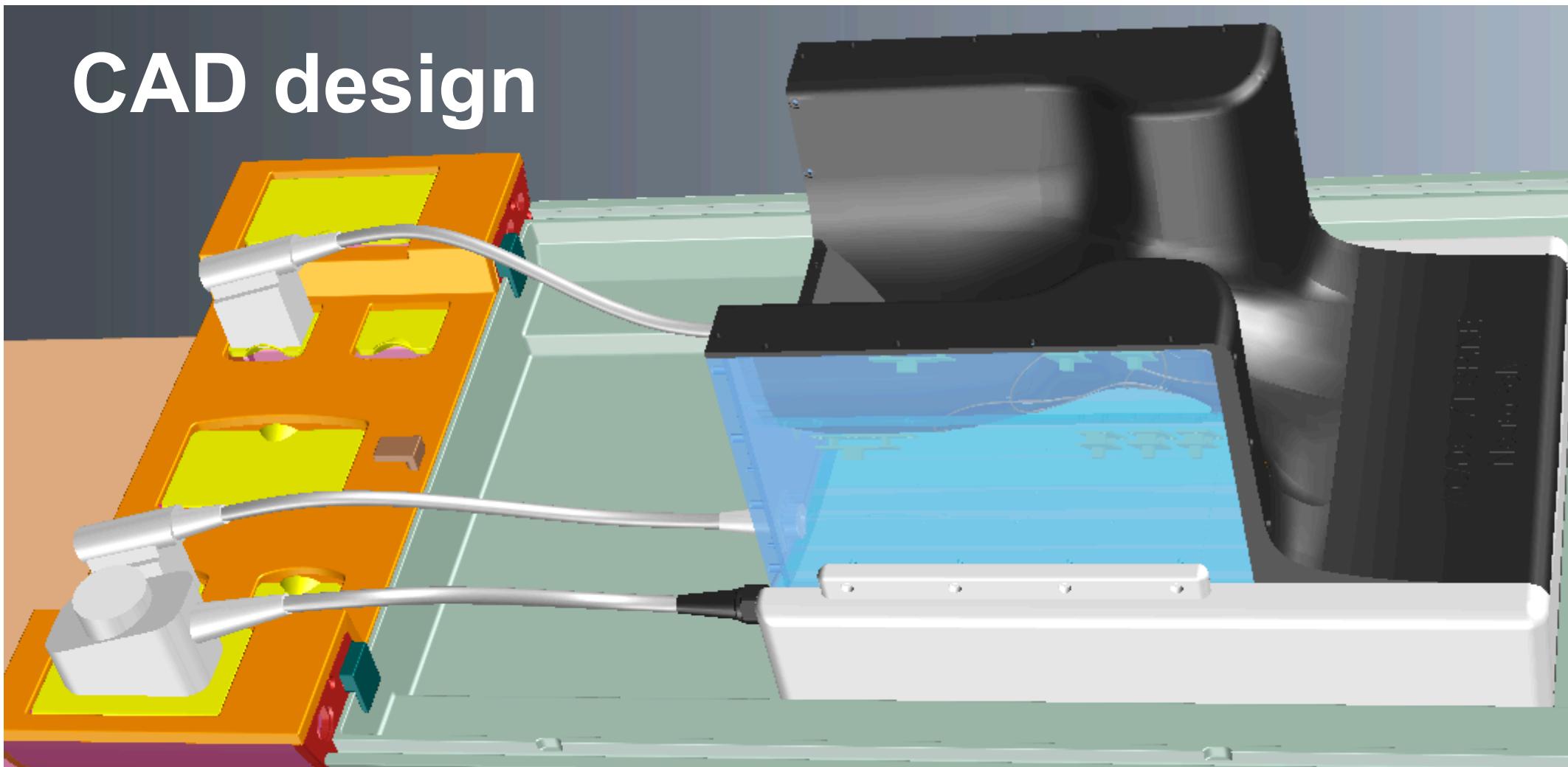
- Geometric coupling (max) with all loops tuned: -17.6dB.



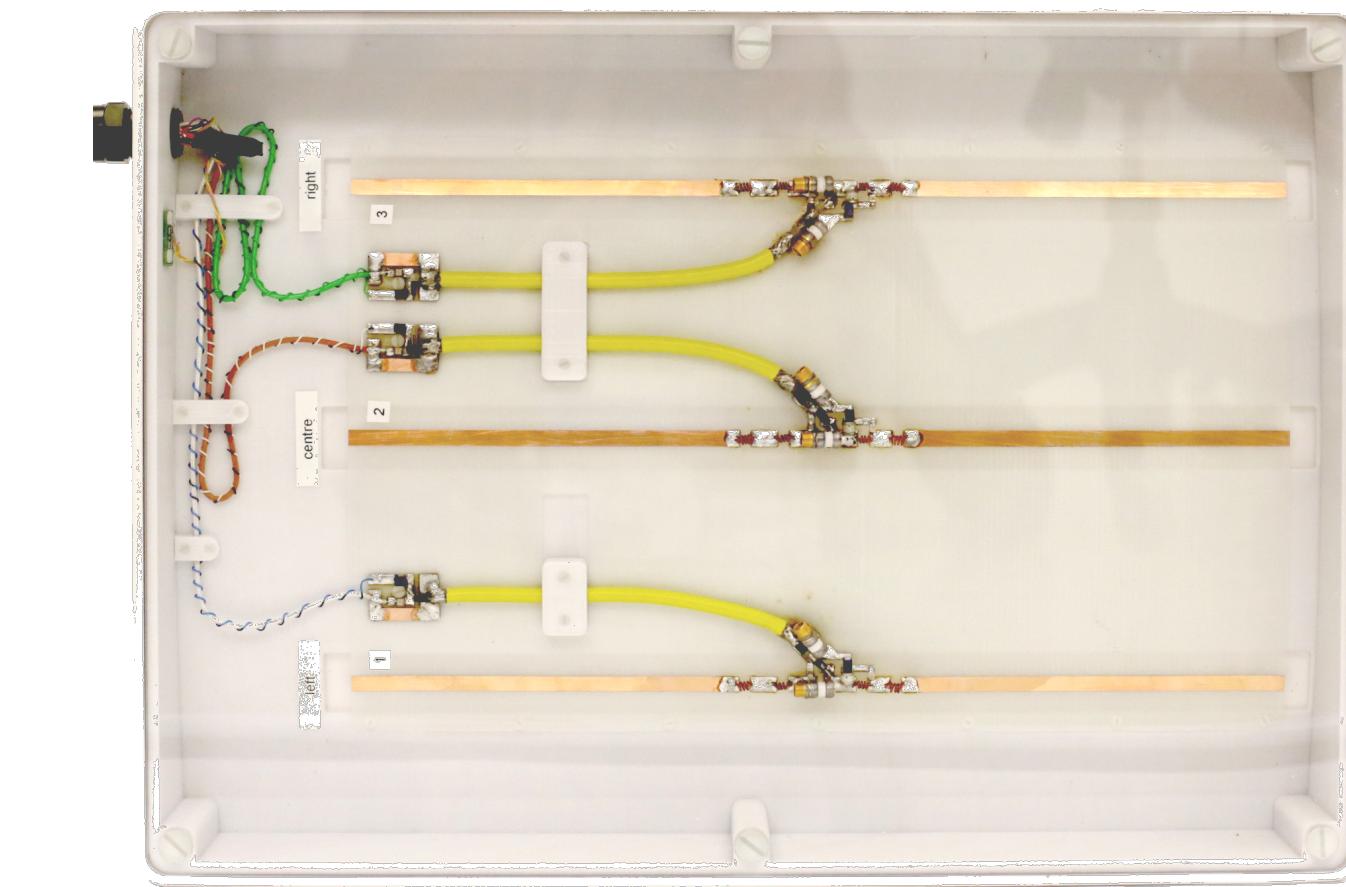
- ~27% variation (sample spinal cord).



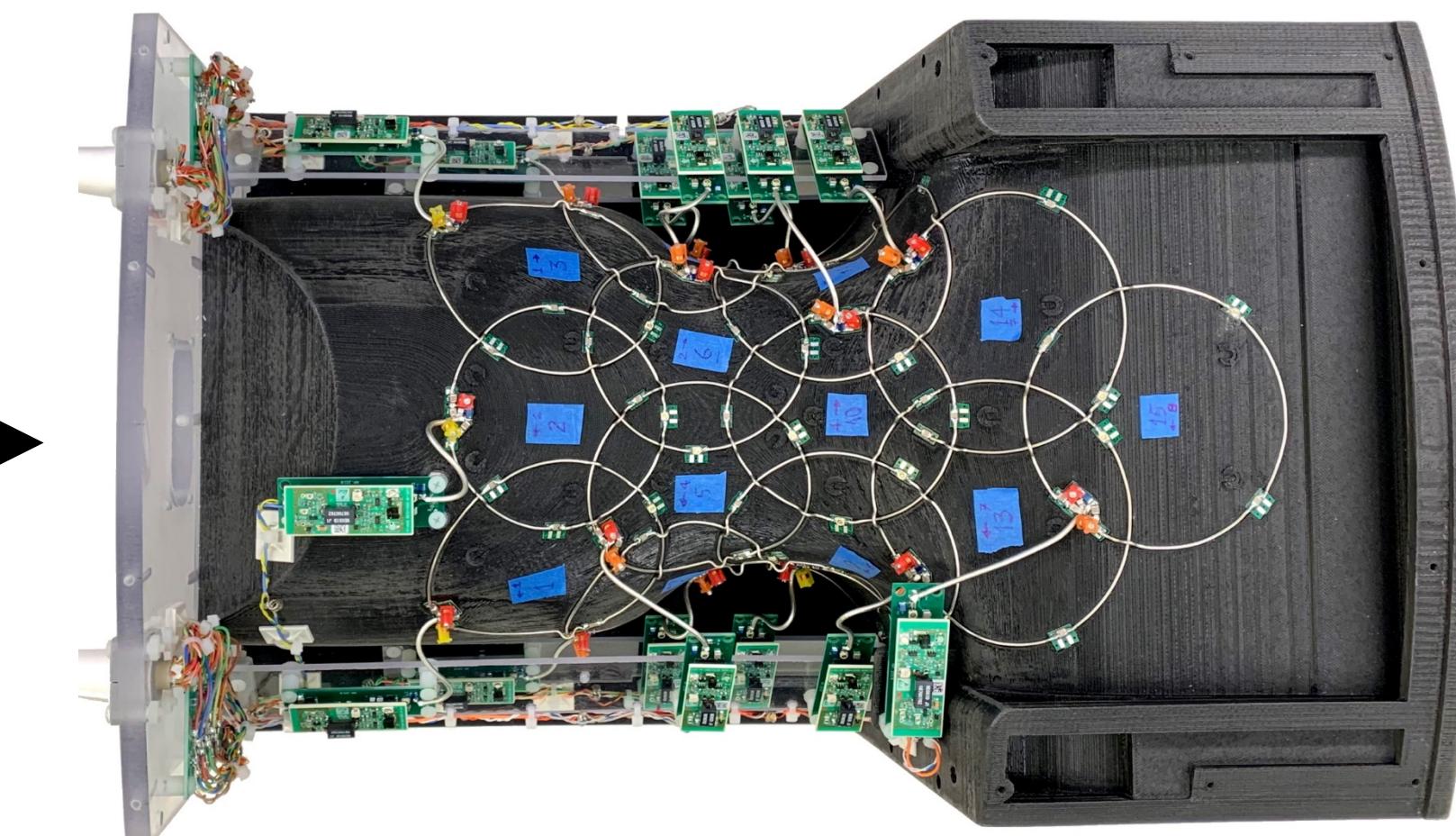
Built prototype



↓
**Tx/Rx
assembly**



→
**Rx coil
(back)**



Acknowledgements



POLYTECHNIQUE
MONTRÉAL

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Kyle Gilbert
Ravi Menon

Reference

Based on:

Lopez Rios N, Topfer R, Foias A, Guittonneau A, Gilbert K, Menon R, Wald L, Stockmann J, Cohen-Adad J. (2019). *Integrated AC/DC coil and dipole Tx array for 7T MRI of the spinal cord.* **27th Annual Meeting of ISMRM, Montreal, Canada**