Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **25** Type: **Poster not-in-competition (Graduate Student) / Affiche non-compétitive (Étudiant(e) du 2e ou 3e cycle)**

(POS-28) Evaluation of AirLink Multi-Resonator Array for Animal Imaging: A Preclinical Study

Tuesday 10 June 2025 18:00 (2 minutes)

Introduction: The development of high-performance radiofrequency (RF) coil arrays is critical for improving image quality and signal-to-noise ratio (SNR) in preclinical imaging applications. The AirLink Multi-Resonator Array (MRA) has demonstrated promising capabilities in human imaging, and this study aims to evaluate its performance in animal models. The objective is to assess the array's efficiency in delivering high-resolution imaging while maintaining optimal safety and compatibility with existing MRI systems.
Methods: A set of AirLink MRA coils was adapted for small-animal imaging using a rat on a 1.5T MRI system. The experimental setup included SNR comparison against conventional coils, B1 homogeneity evaluation, and assessment of heating effects during imaging. Phantom studies were conducted to calibrate and optimize the system parameters before in vivo imaging.
Results: Preliminary results indicate that the AirLink MRA provided superior SNR compared to conventional single-loop coils. The array design allowed for improved spatial resolution, enabling detailed anatomical imaging with reduced scan times. B1 mapping confirmed uniform field distribution, and thermal analysis showed no significant heating effects, ensuring safe imaging conditions for live subjects.
Discussion and Conclusion: The AirLink Multi-Resonator Array demonstrated high feasibility for preclinical imaging applications, offering enhanced imaging performance while maintaining safety standards. These findings suggest that the system could be a valuable tool for small-animal MRI research, with potential applications in neuroimaging, oncology, and cardiovascular studies. Future work will focus on further optimization and validation across different animal models and imaging protocols.

Keyword-1

Multi-Resonator Array

Keyword-2

MRI

Keyword-3

RF Coils

Authors: Dr ZHANG, Gong (SCHERI (Sino Canada Health Engineering Research Institute (Hefei) Ltd.)); Ms ZHANG, Grace (Western University); Mr ZHU, Haoqing (SCHERI (Sino Canada Health Engineering Research Institute (Hefei) Ltd.)); Dr MARTIN, Melanie (University of Winnipeg); Ms REN, Yujie (University of Winnipeg)

Presenter: Ms REN, Yujie (University of Winnipeg)

Session Classification: DPMB Poster Session & Student Poster Competition | Session d'affiches DPMB et concours d'affiches étudiantes (7)

Track Classification: Technical Sessions / Sessions techniques: Physics in Medicine and Biology / Physique en médecine et en biologie (DPMB-DPMB)