

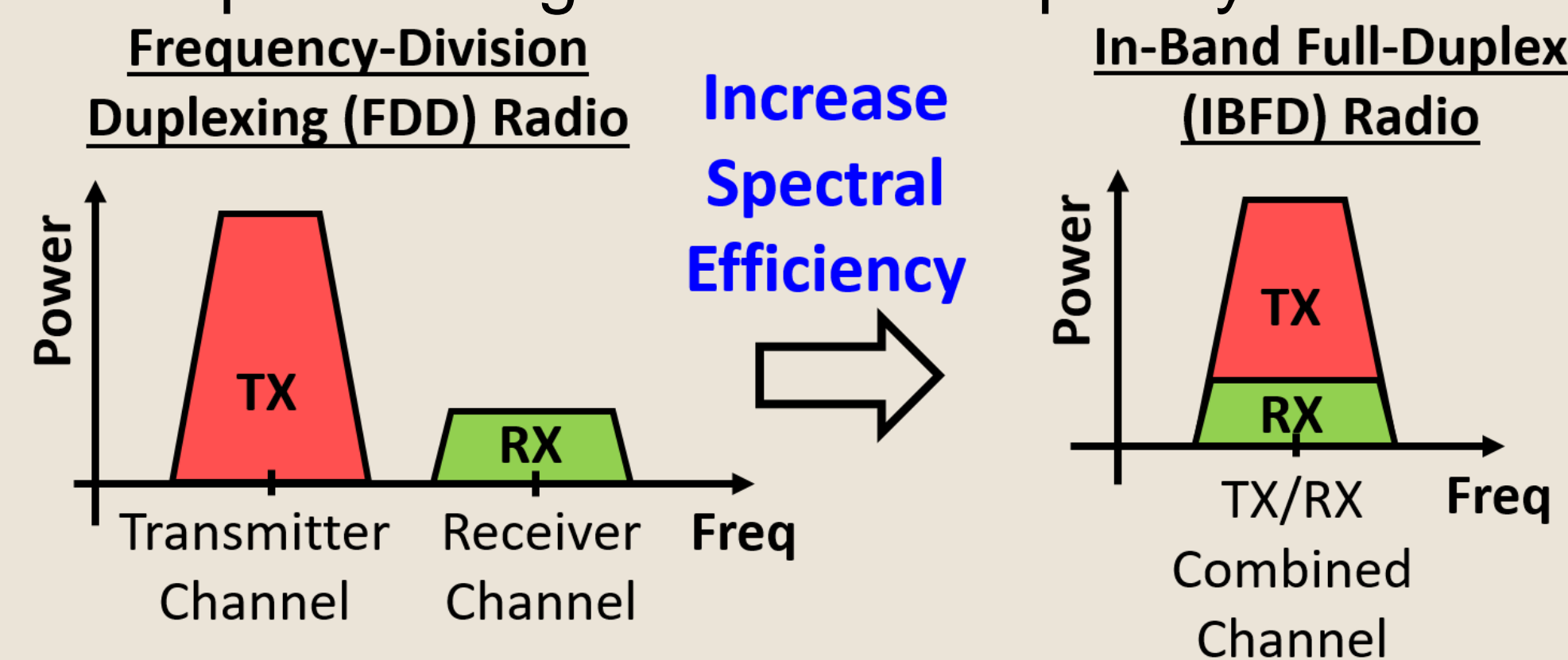


A Highly Tunable RF Self-Interference Canceler with Machine-Learning Accelerated Adaptation for Full-Duplex Radios

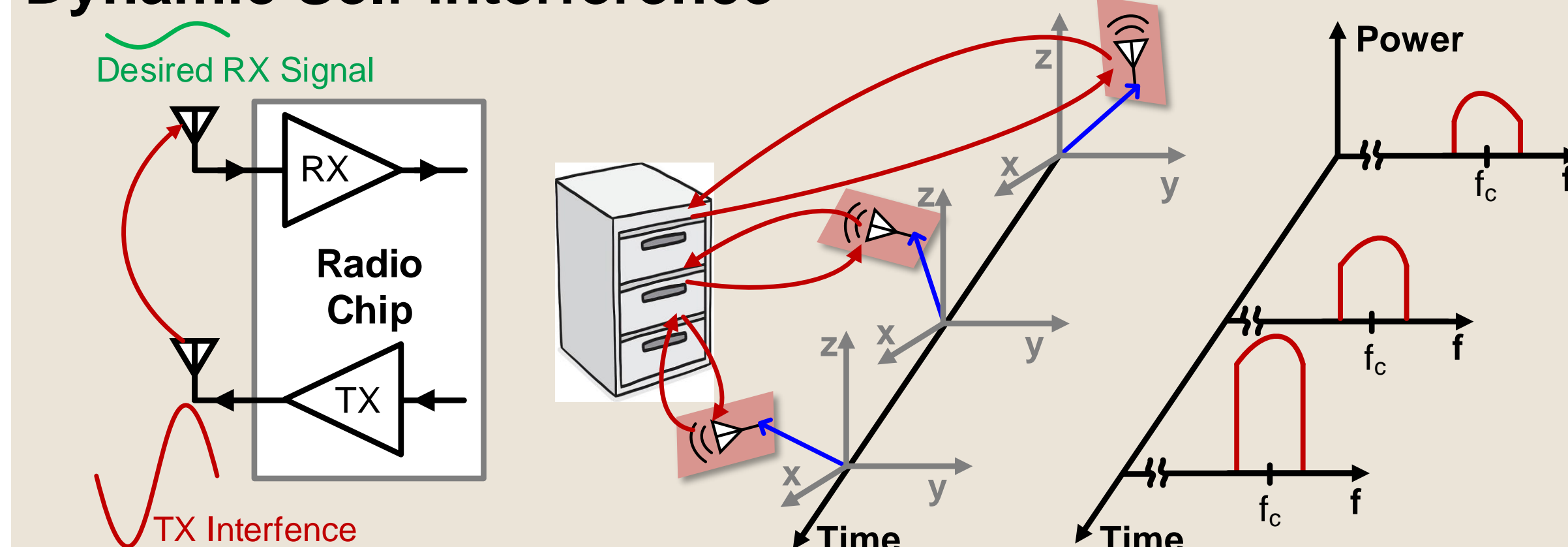
STUDENTS: Xichen Li, Elpida Karapepera, Ahmed Aboulsaad, Lucas Ritzdorf
ADVISOR: Chris Rudell

Introduction - Background

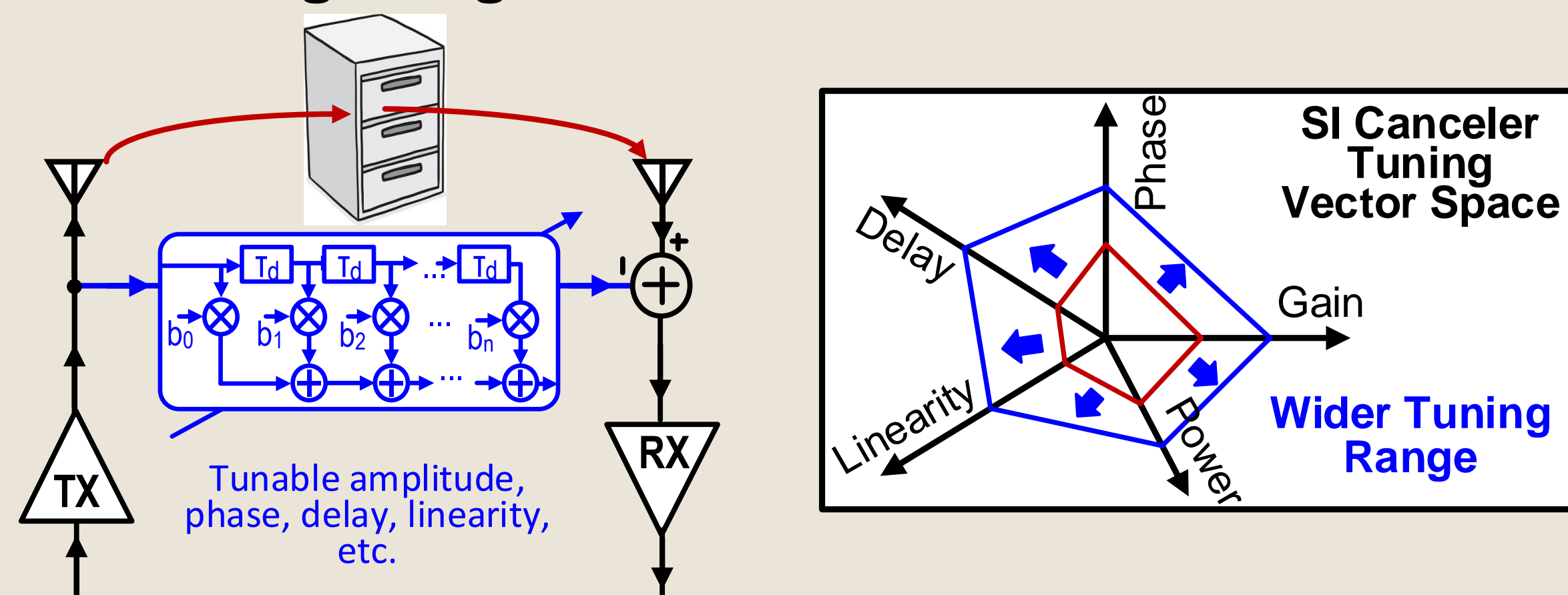
- In-band Full-duplex Radios:** Simultaneous transmission and reception using the same frequency band.



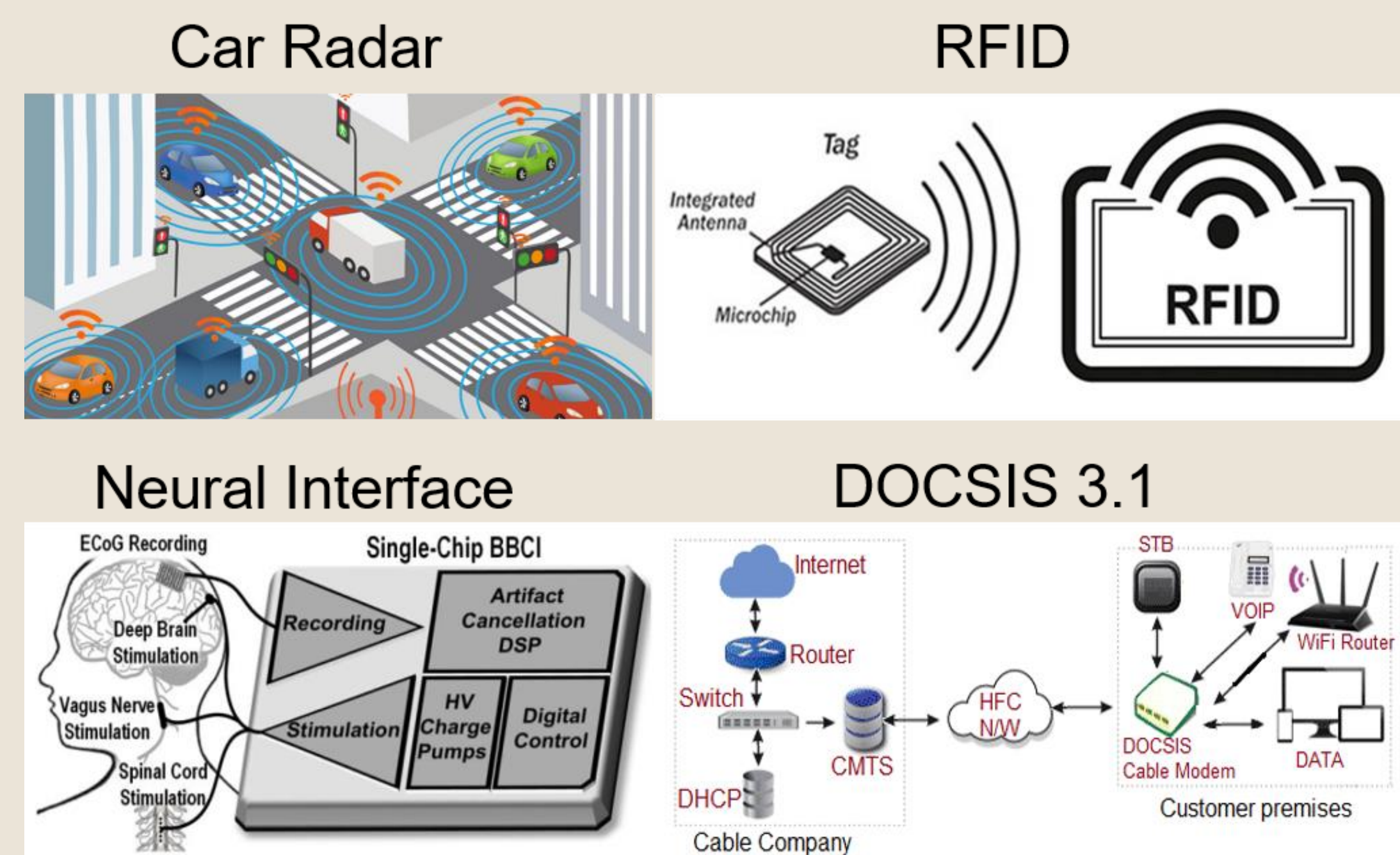
- Self-interference (SI) Mitigation Challenges**



Wide Tuning Range of SI cancellation

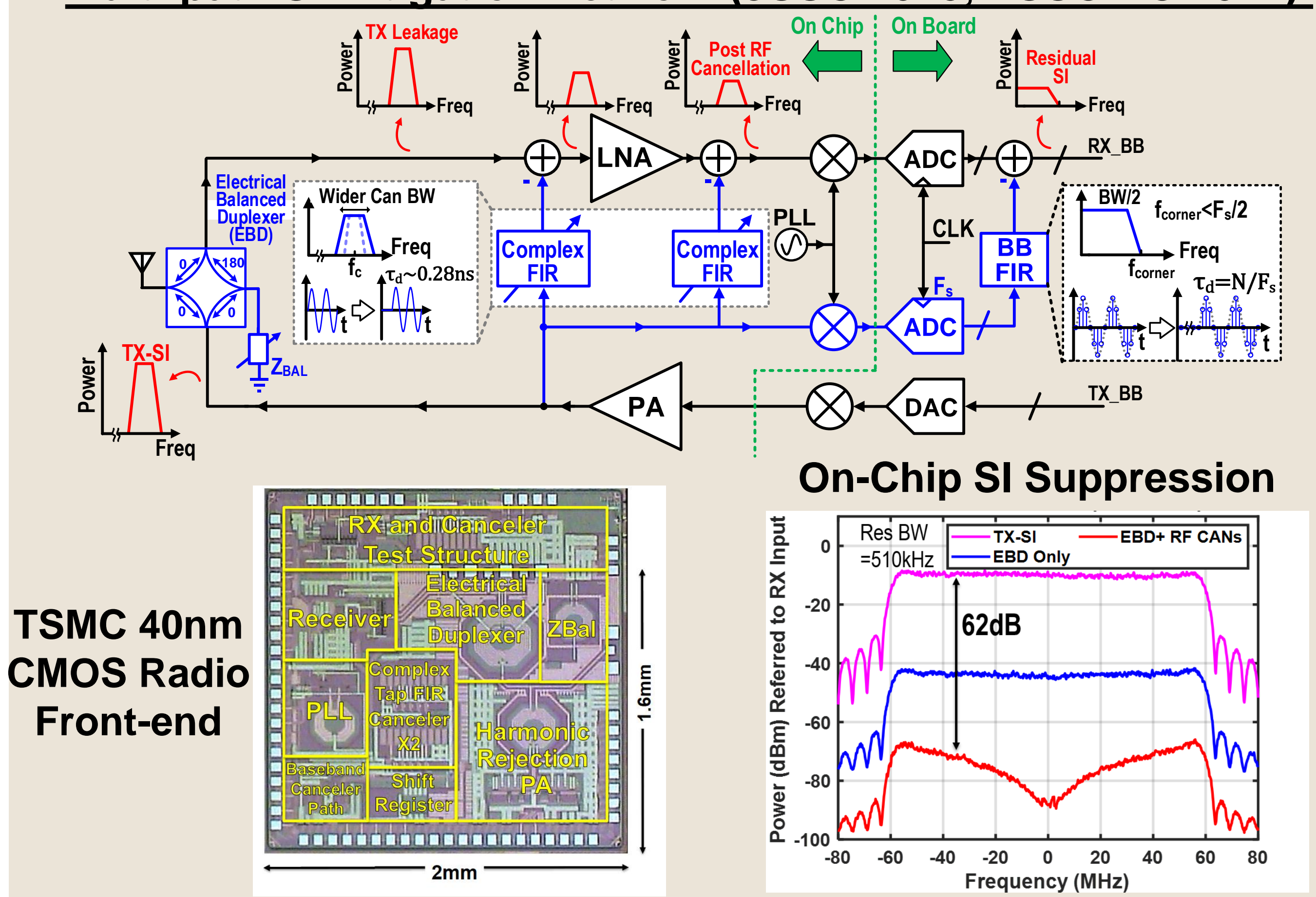


- Self-Interference Cancellation Applications**



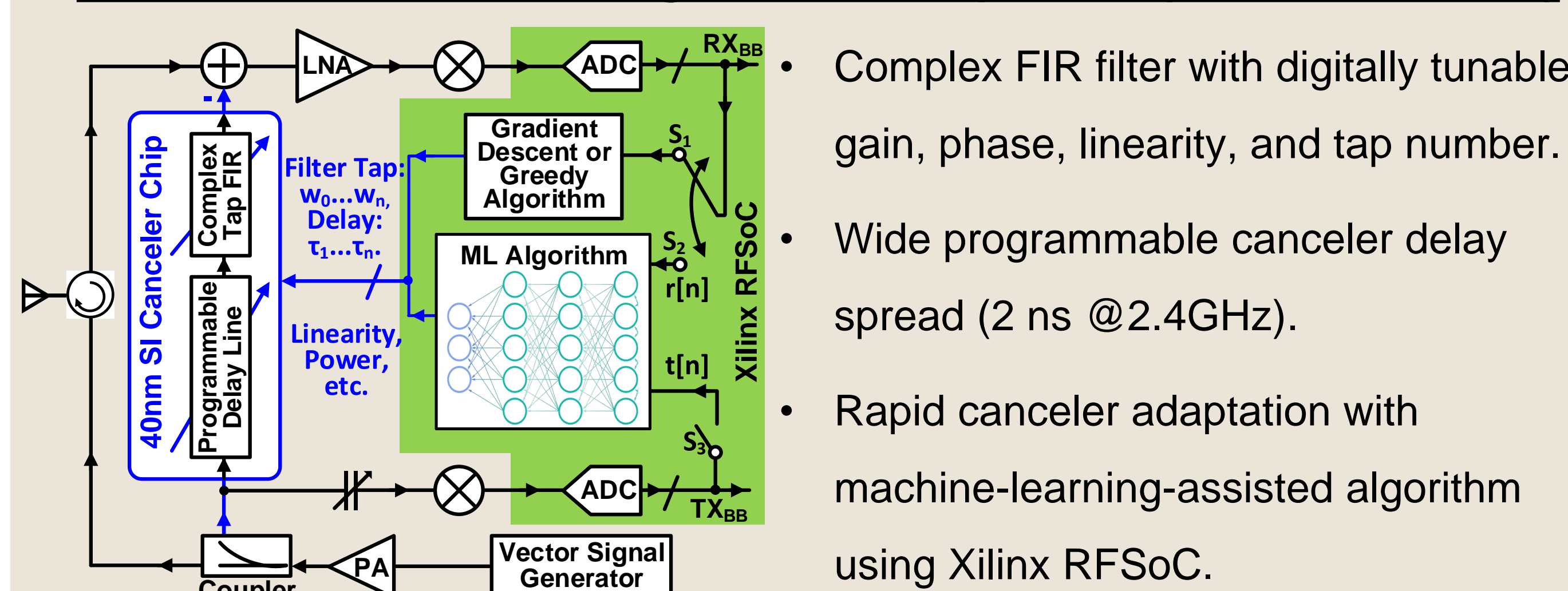
FAST Lab Previous Full-Duplex Radio Chips

- Multi-path SI Mitigation Network (JSSC 2023, ESSCIRC 2022):**

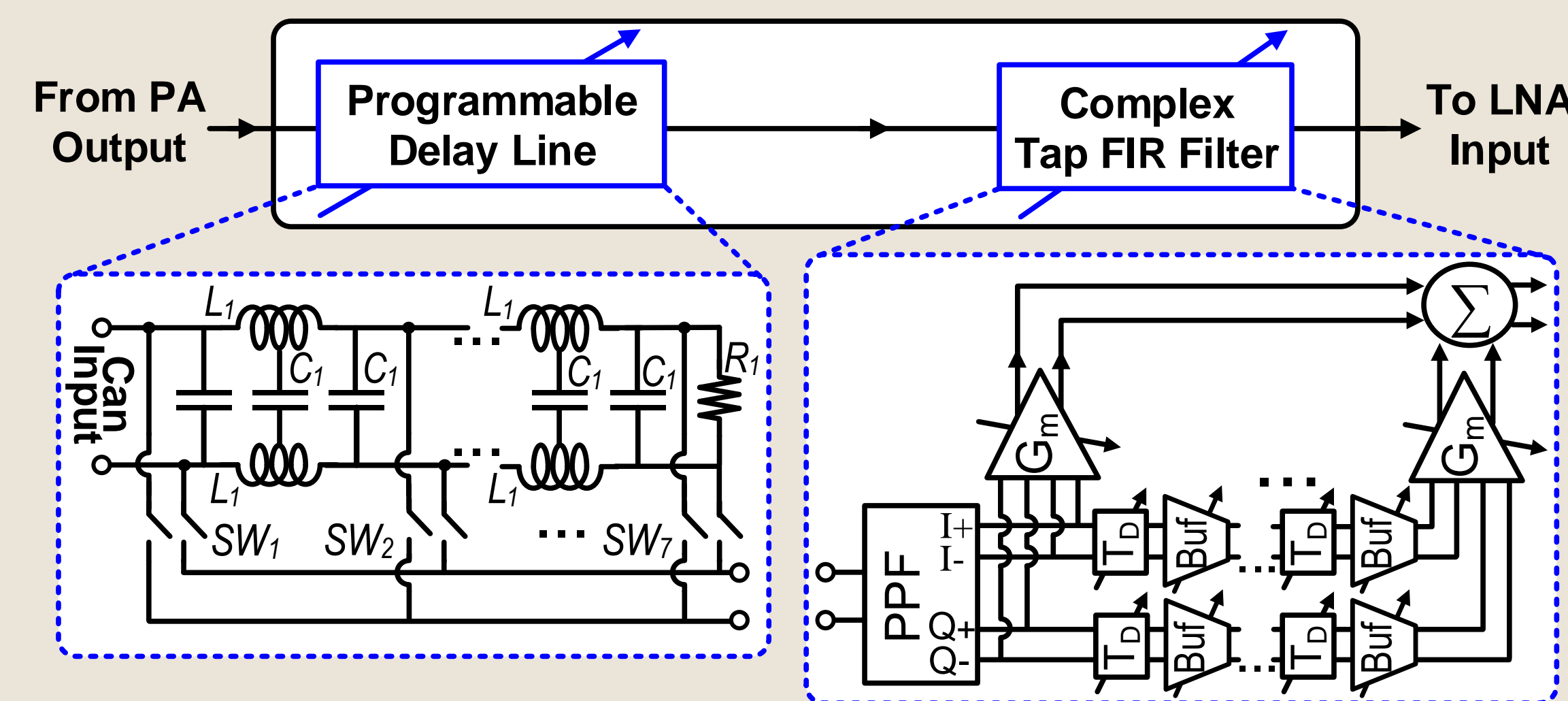


Proposed ML-Augmented Architecture

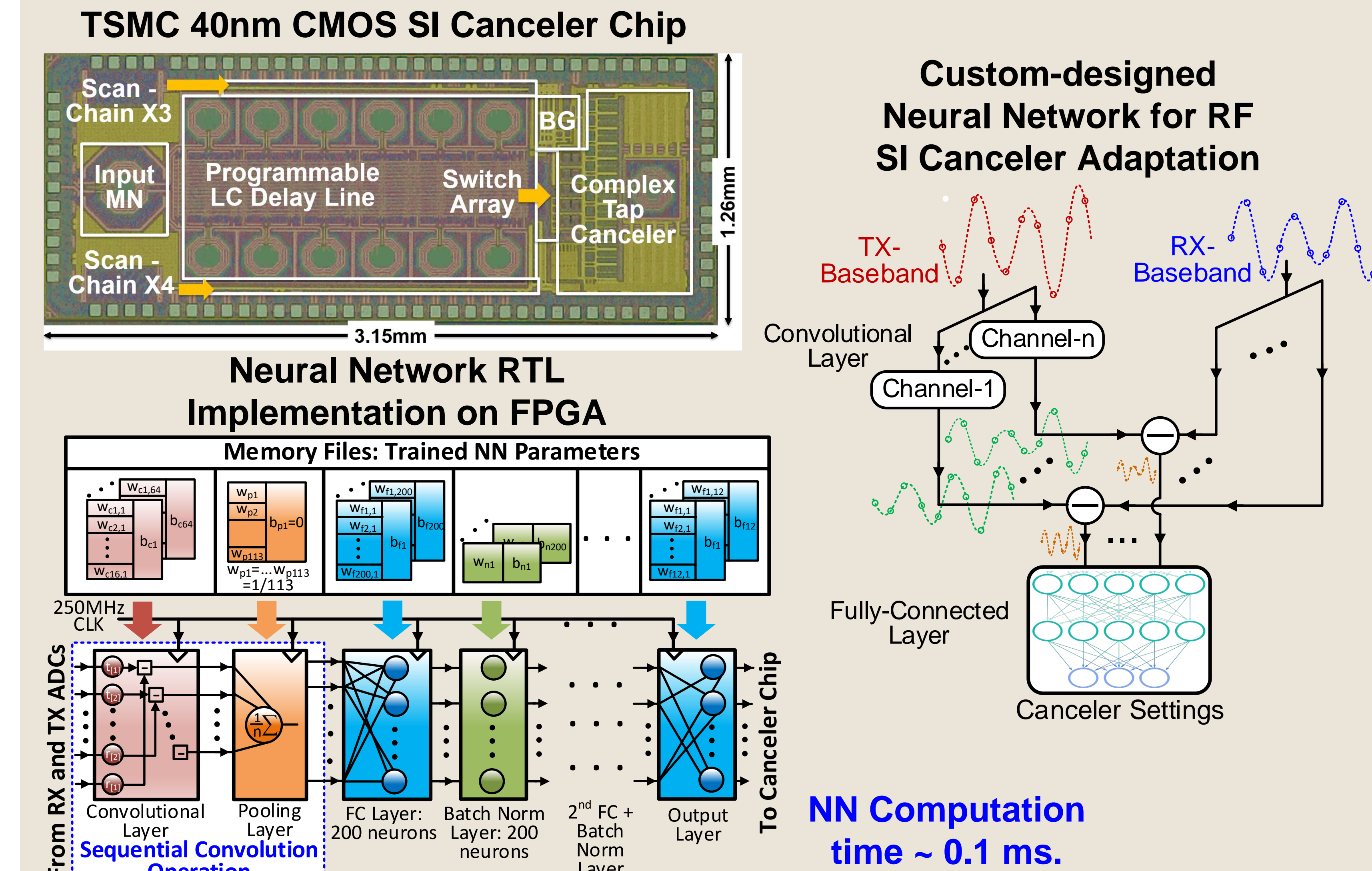
- RF Canceler with ML-Augmented Adaptation (ESSCERC 2024)**



- Highly Tunable RF SI Canceler Chip Block Diagram**



SI Canceler Chip and ML-Algorithm Implementation



Test Setup and Measurement Results

