

2023-1 Biannual Workshop

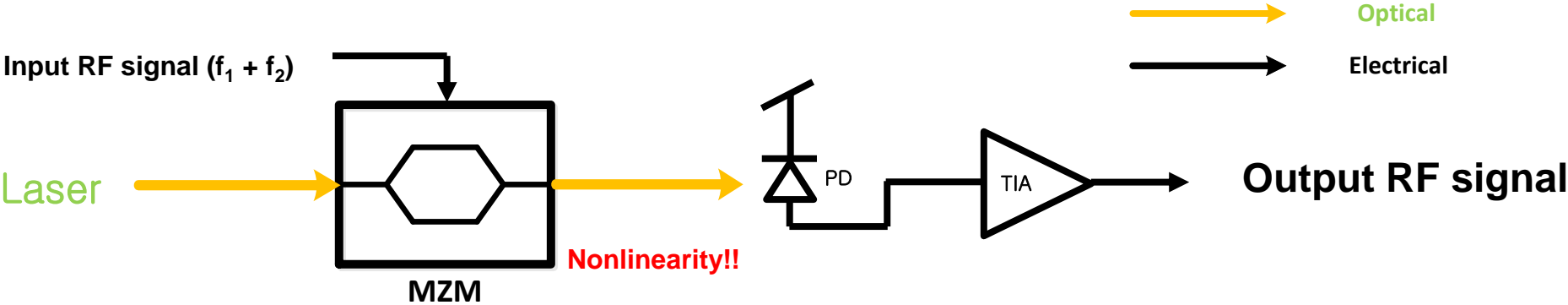
Min-Hyeok Seong

1885

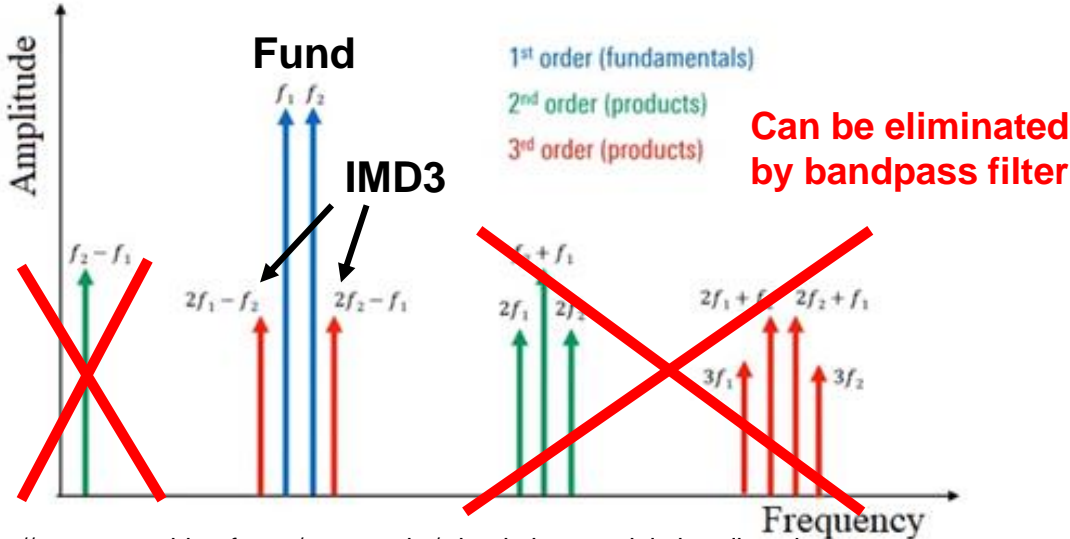
**High-Speed Circuits & Systems Lab.
Dept. of Electrical and Electronic Engineering
Yonsei University**

2023-1 semester

➤ Si MZM Linearity



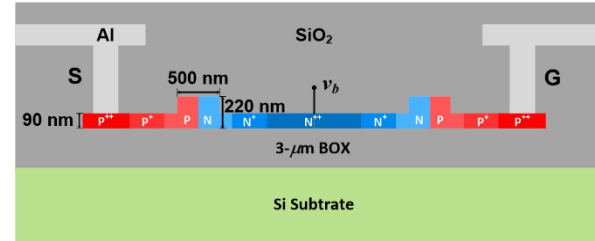
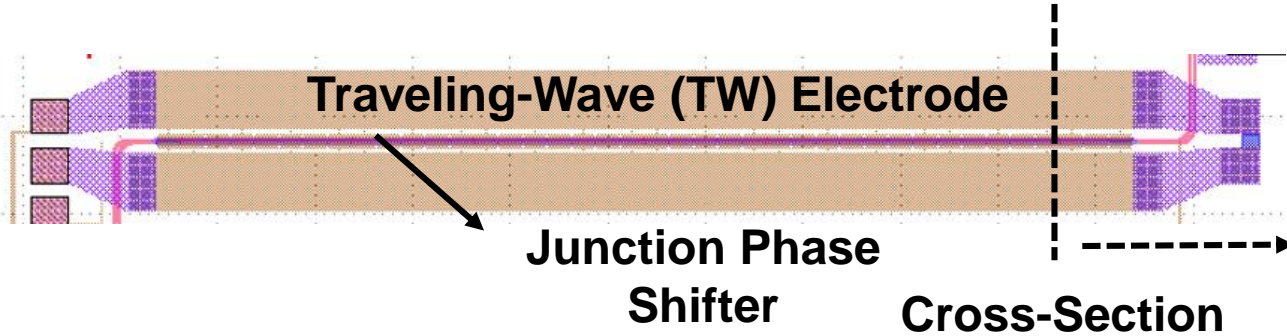
Harmonics & Intermodulation Products



<https://www.everythingrf.com/community/what-is-intermodulation-distortion>

2023-1 semester

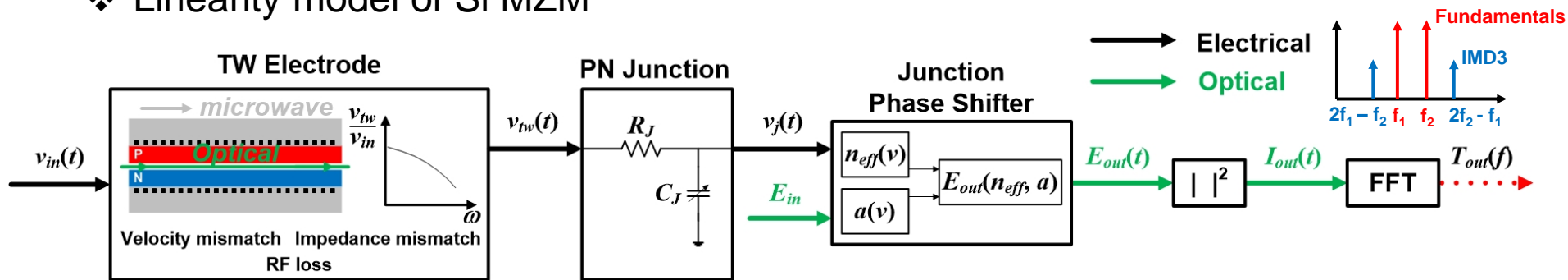
➤ Si MZM Linearity Characterization



❖ Factors of nonlinearity

- ① Nonlinear voltage-dependent n_{eff} caused by doped Si waveguide
- ② Nonlinear junction RC caused by doped Si waveguide
- ③ Effect of traveling-wave electrode

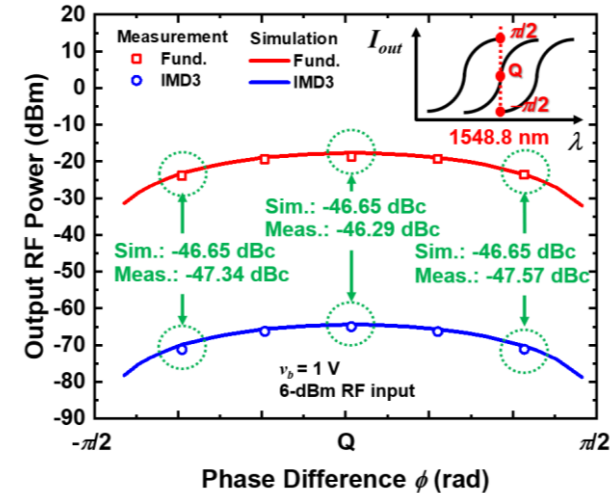
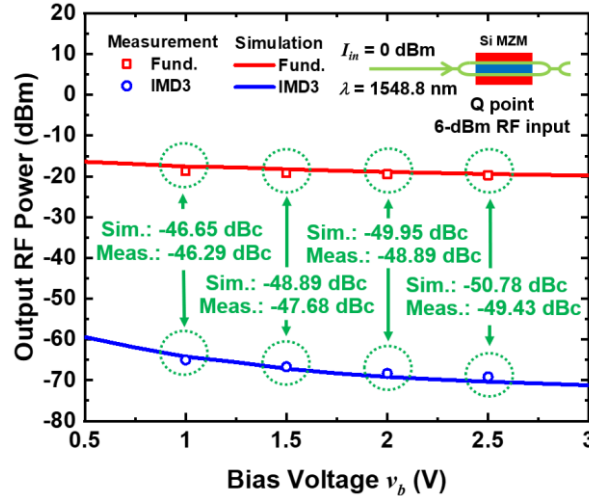
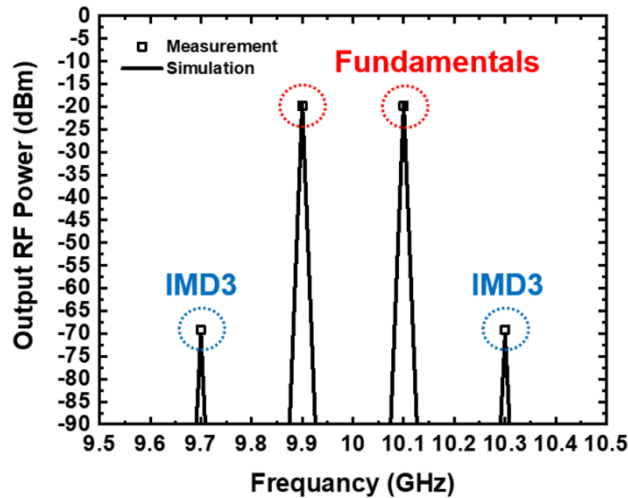
❖ Linearity model of Si MZM



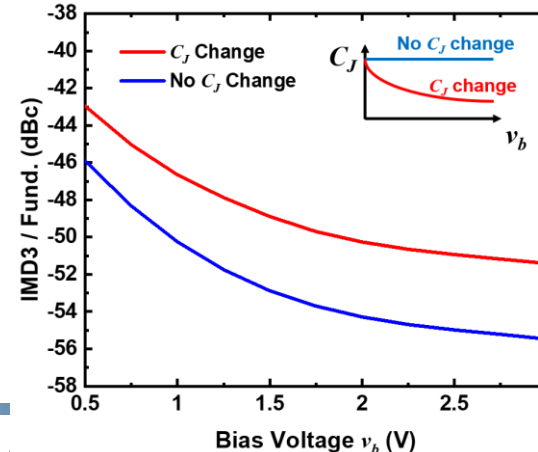
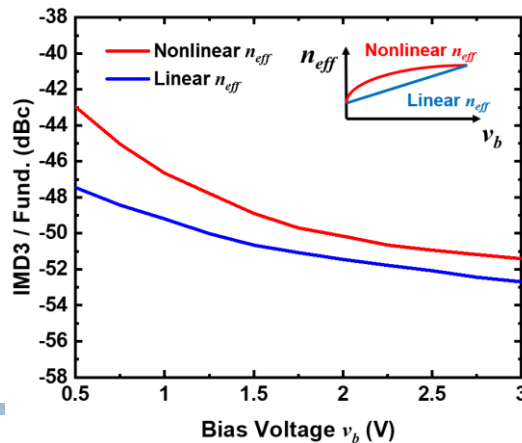
2023-1 semester

➤ Si MZM Linearity Characterization

❖ Simulation vs. Measurement



❖ Simulation w/ controlled parameters



2023-2 Plan

- 설계
 - 9월: AMF (40 GHz Si MZM)
 - 2024 1 ~ 2월: HyperLight (LiNbO3 MZM, ring modulators)
- 측정
 - 2024 2월: AMF (40 GHz Si MZM)
- 논문
 - Linearity characterization of Si MZM (revision)
 - SPIE 2024