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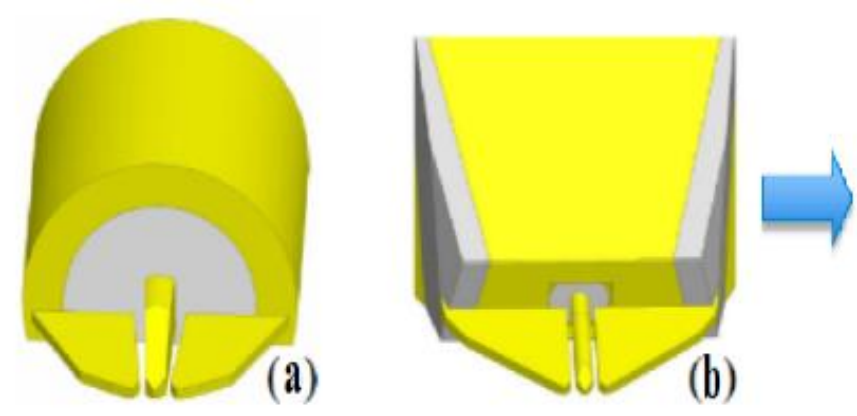
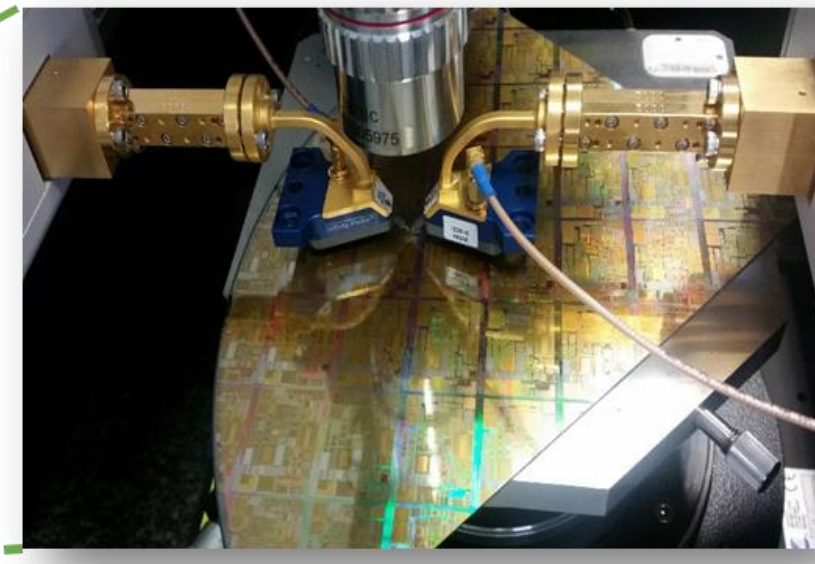
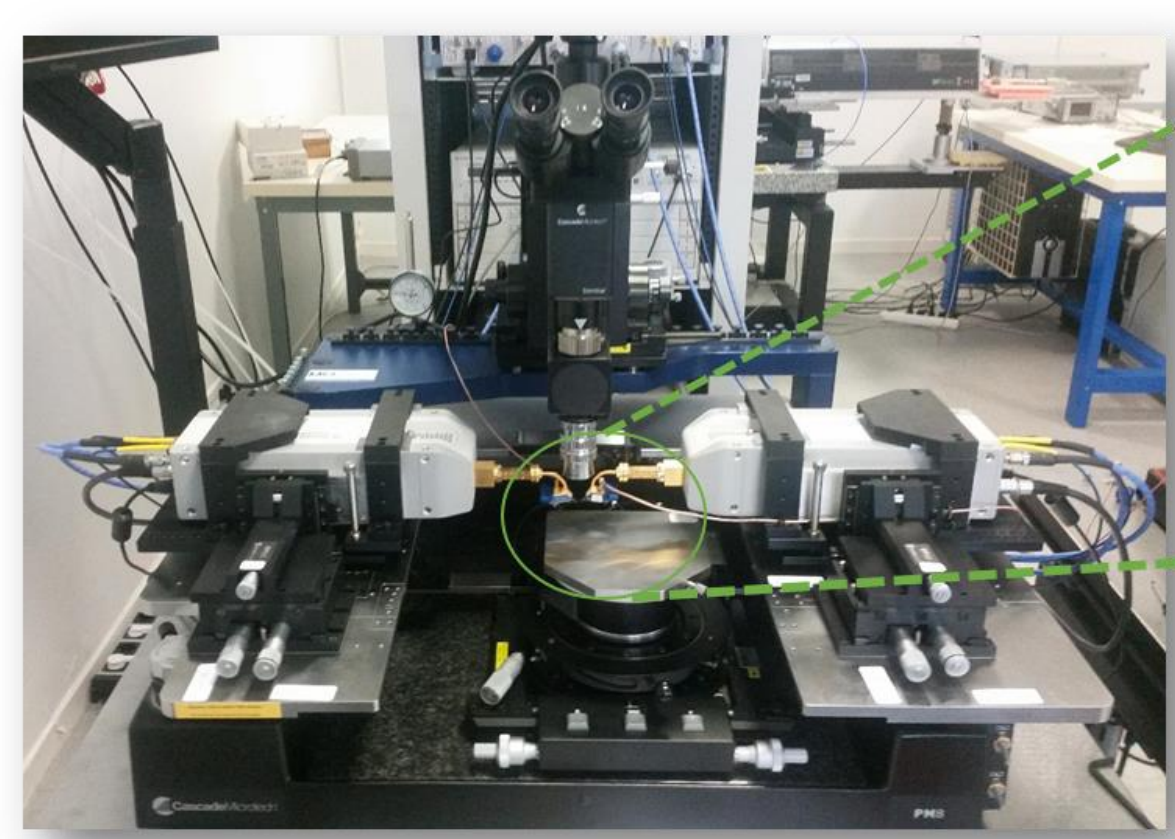
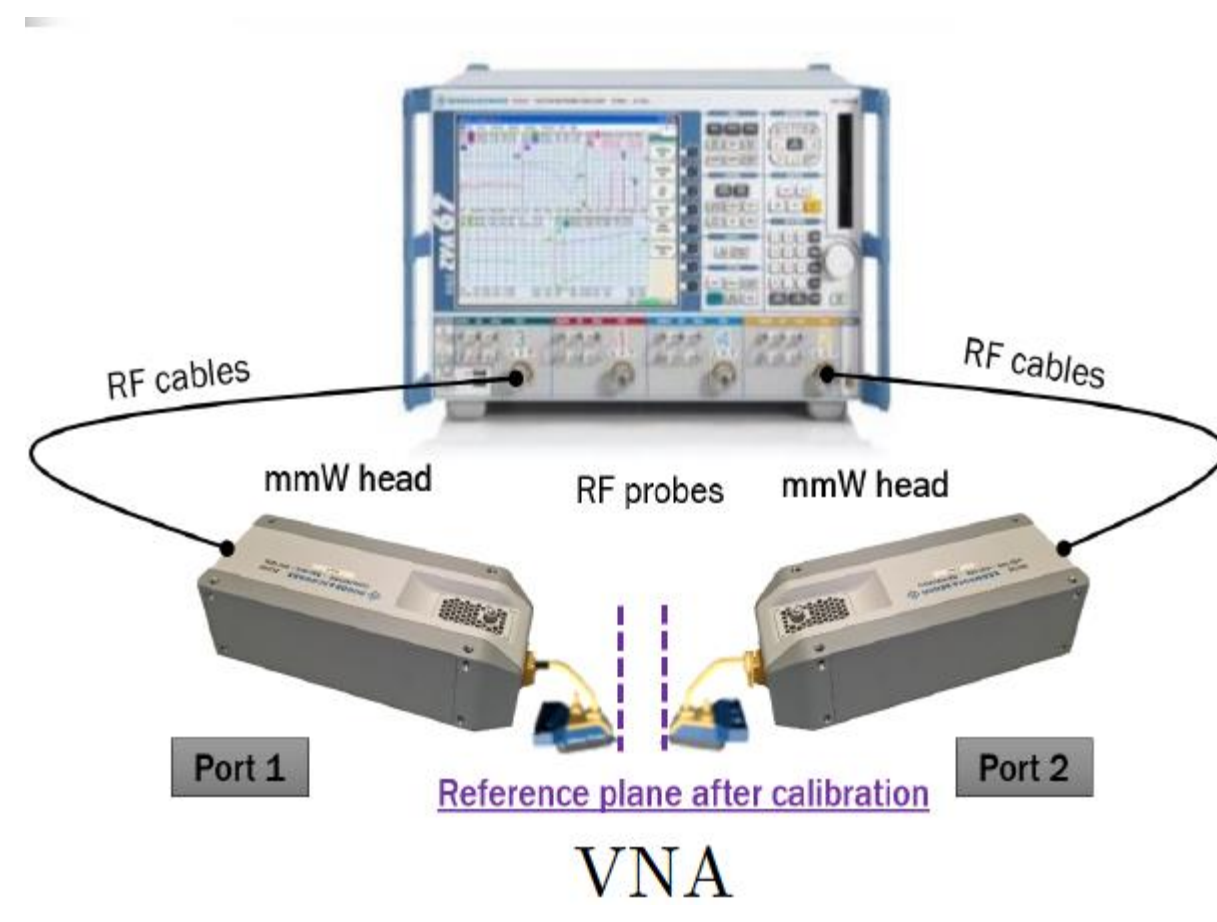
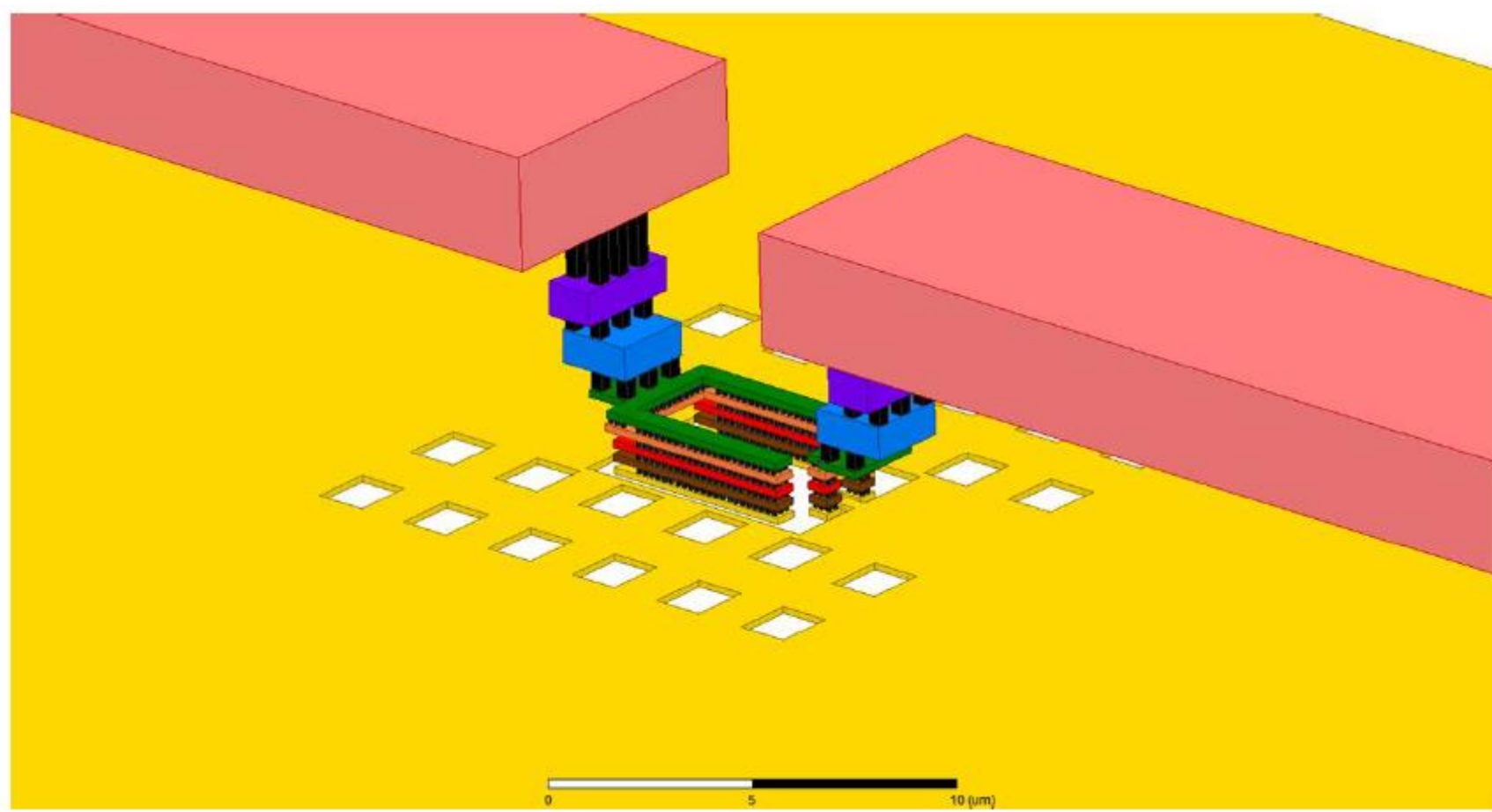
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Assessment of device RF performance and behavior using TCAD simulation

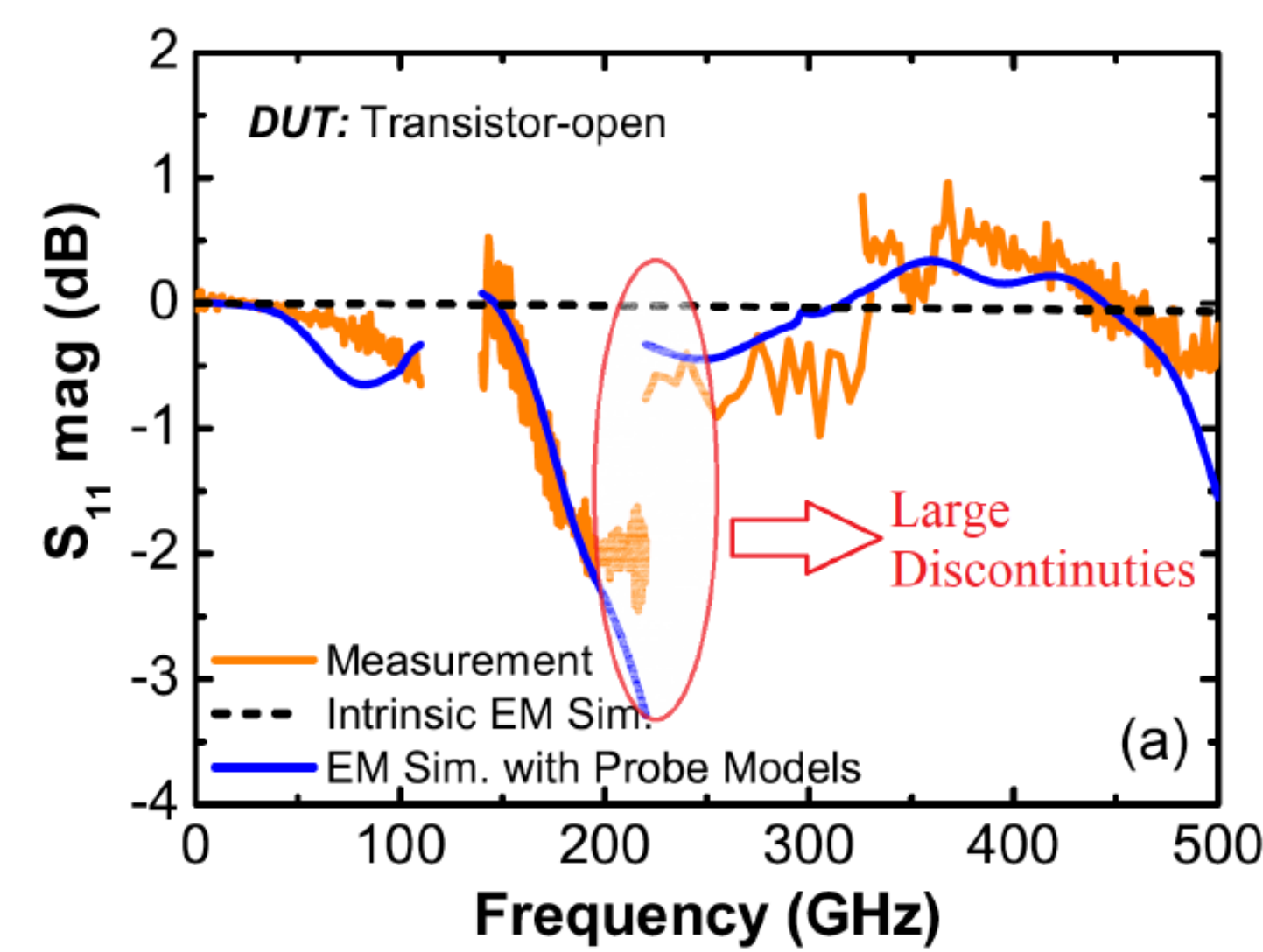
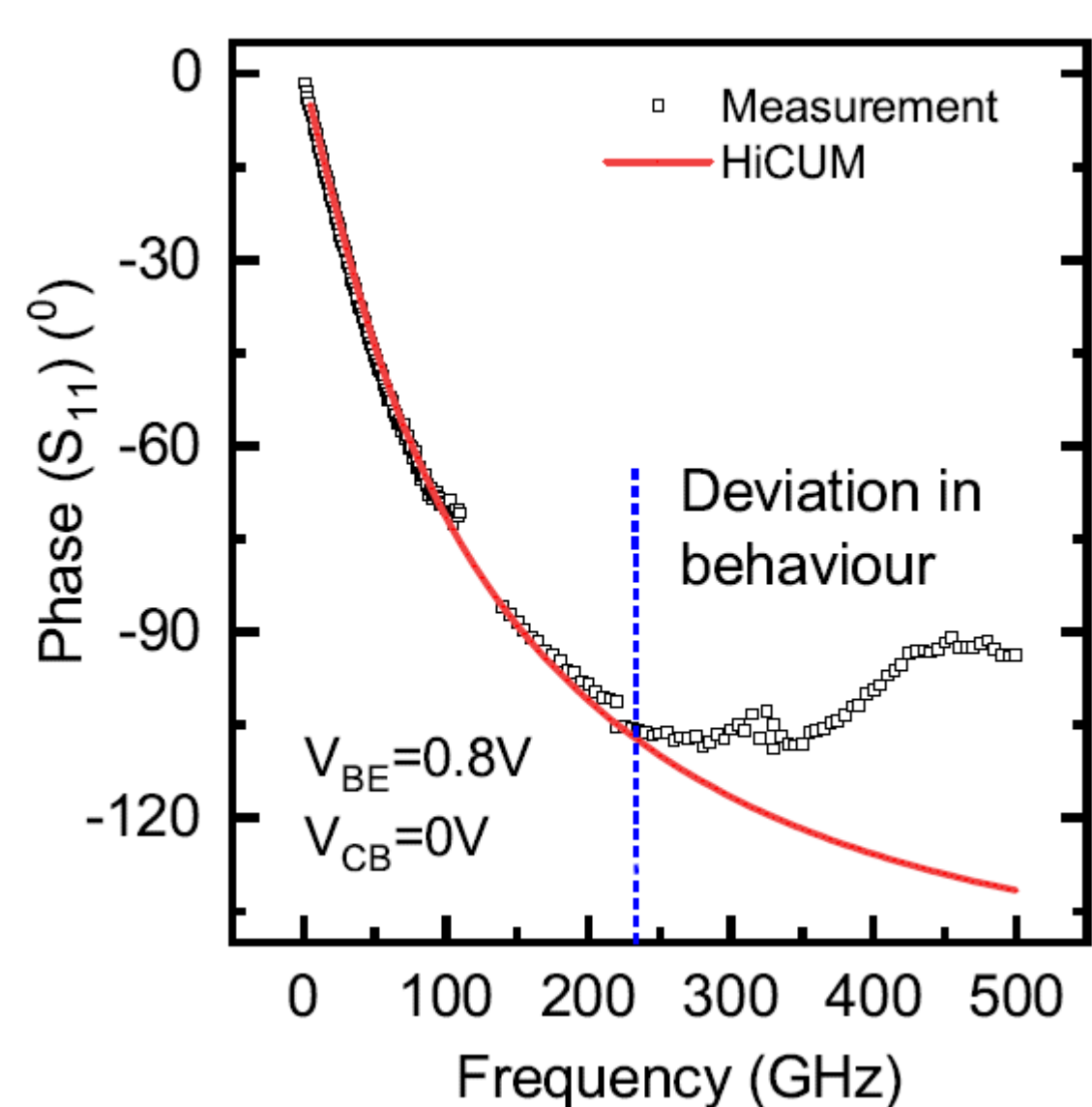
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Introduction

Characterization above 110 GHz is still a challenge. So TCAD simulation has been done to estimate the measurements.



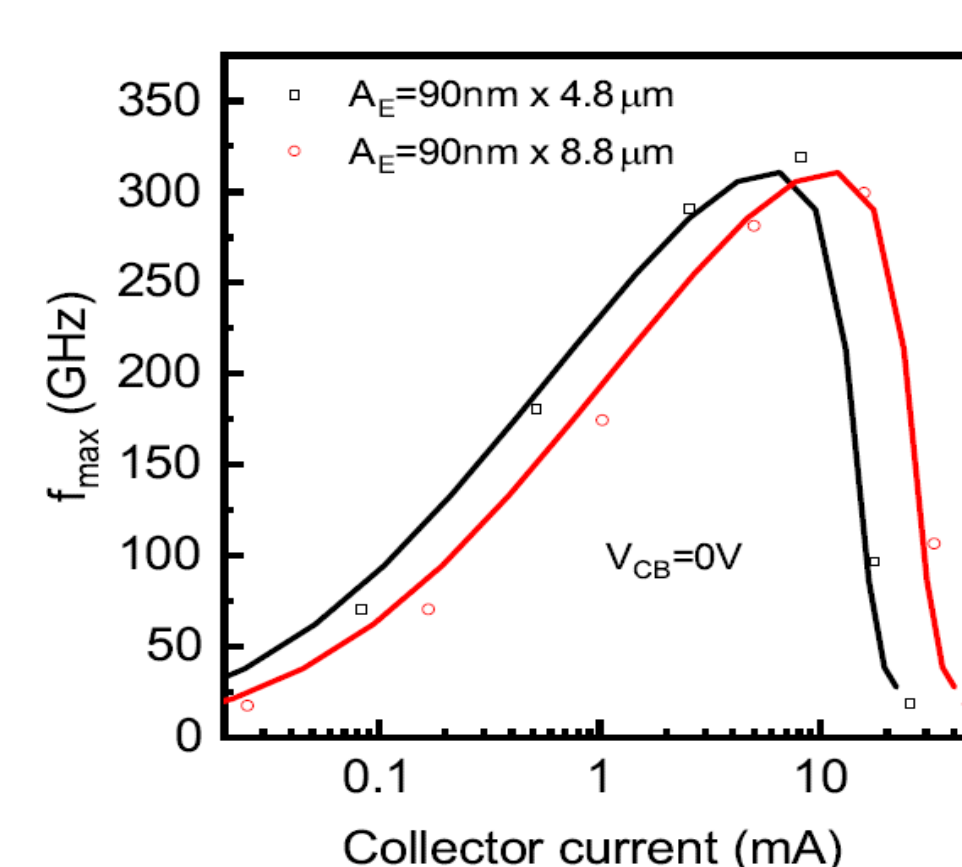
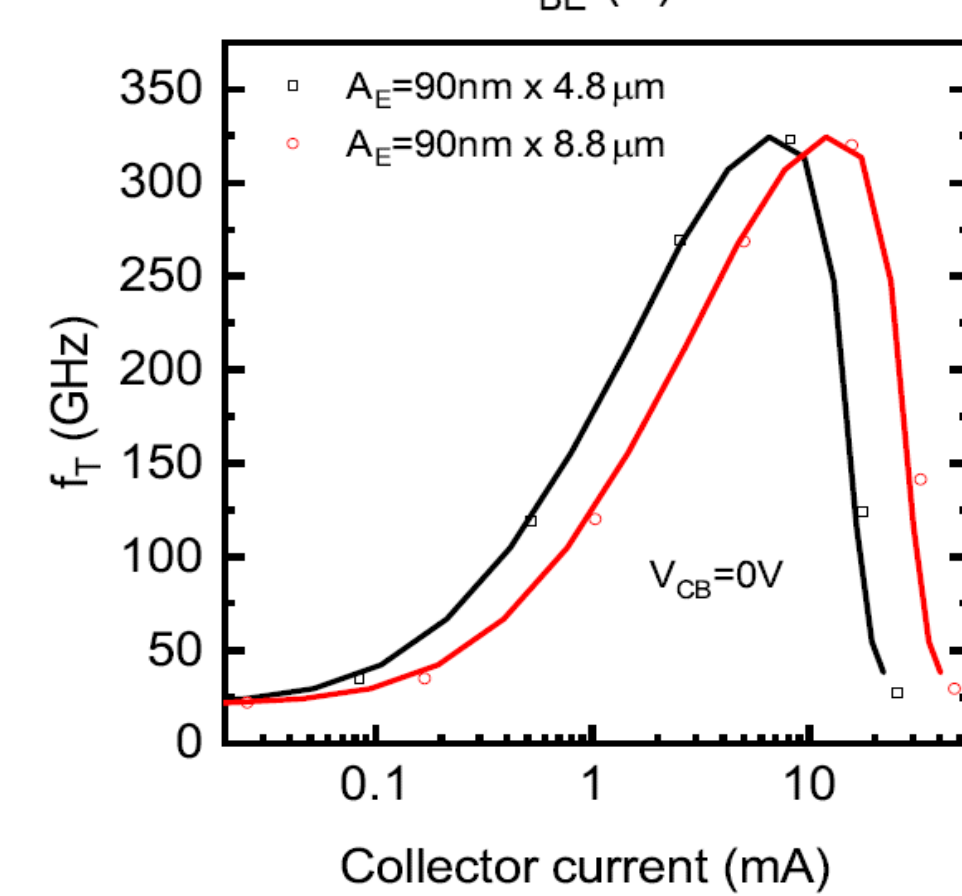
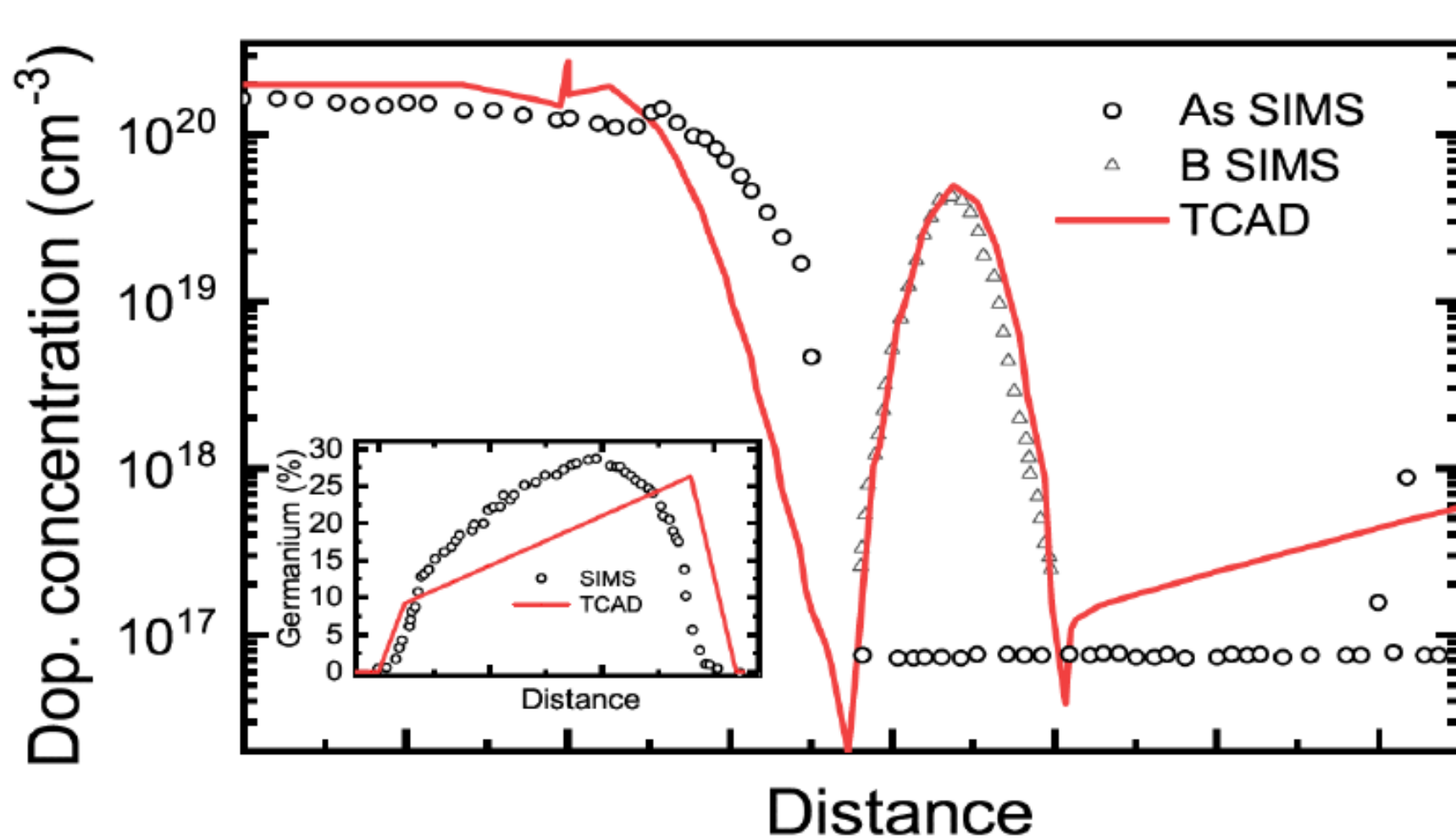
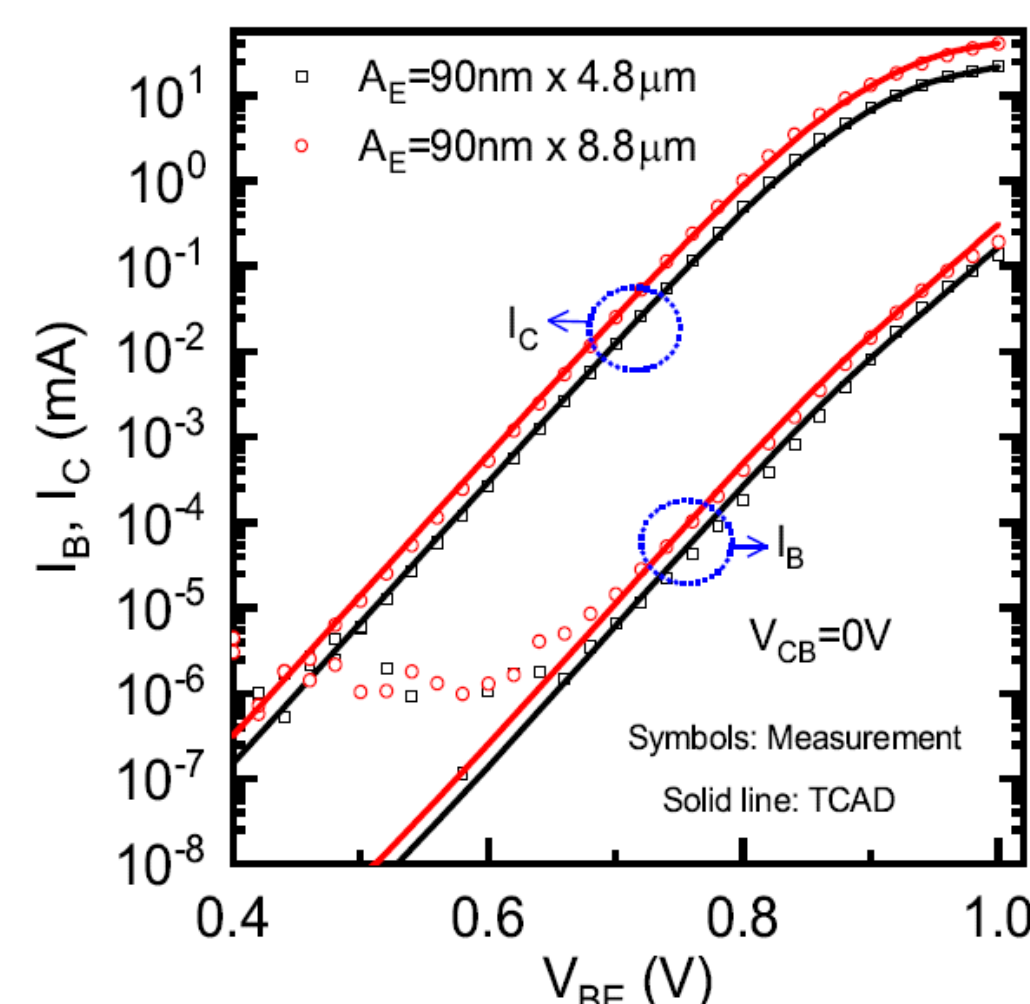
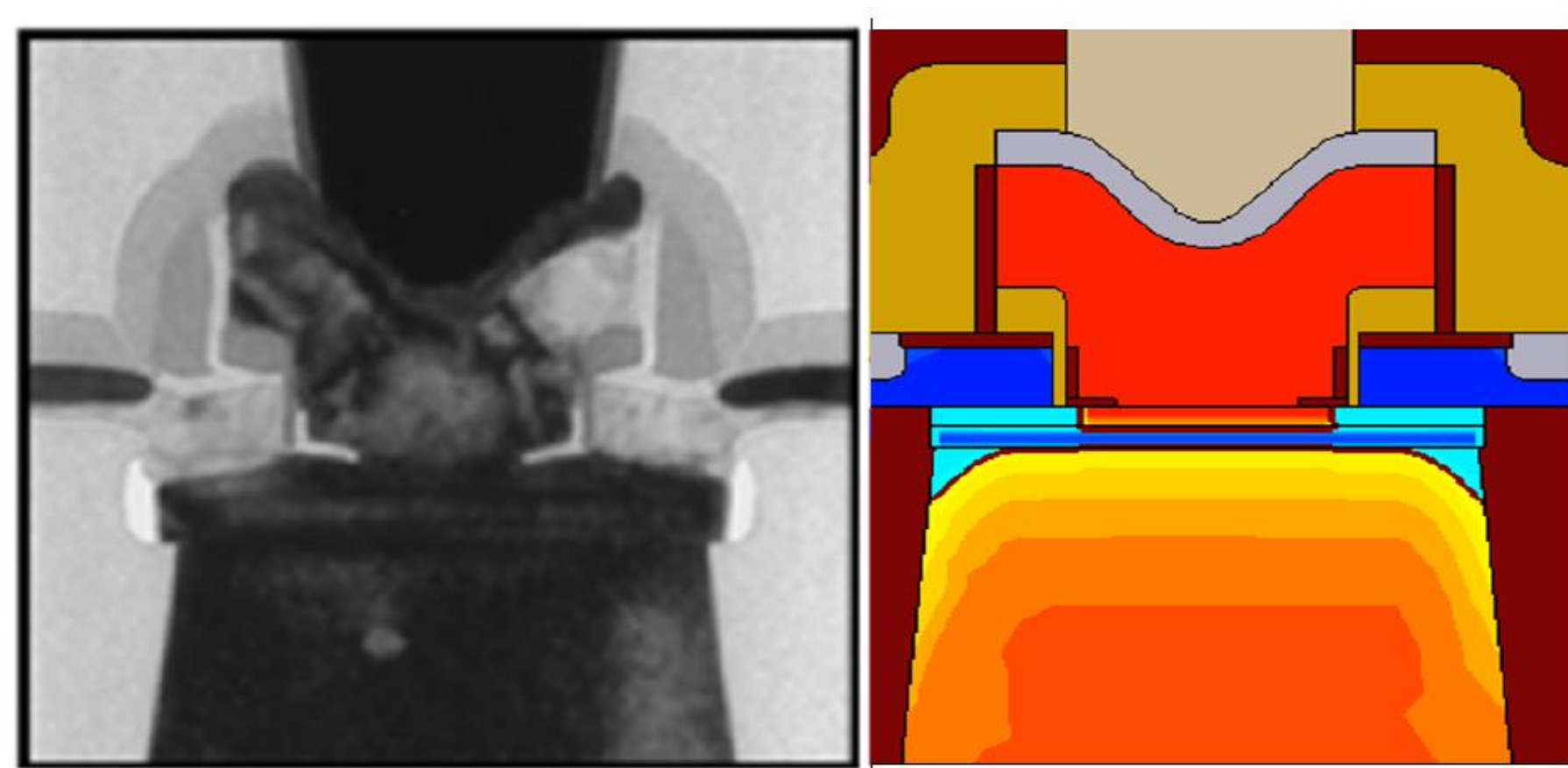
140-220GHz 220-325GHz



Measurement Uncertainties !

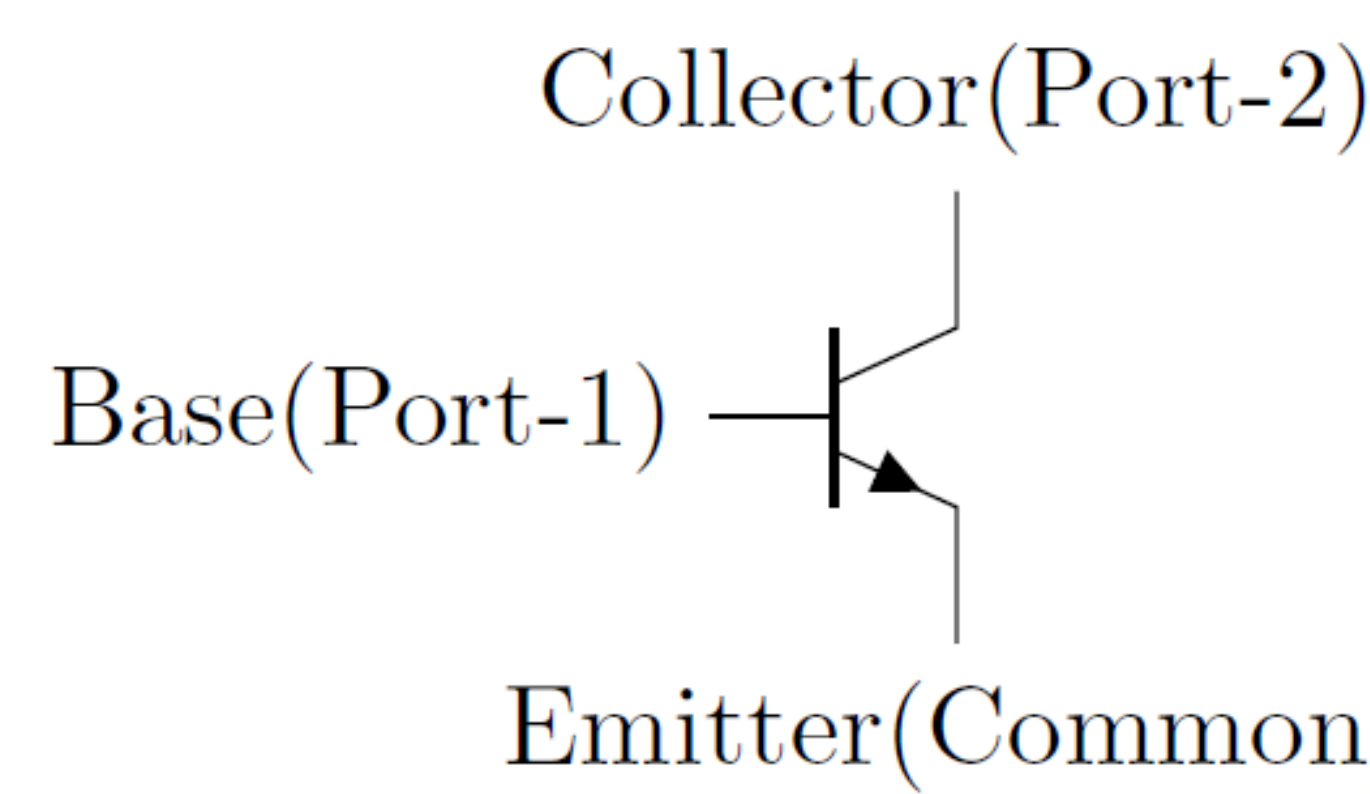
1. Probe positioning errors (Thru to Line)
2. Contact issue
3. Change of coupling

TCAD Calibration

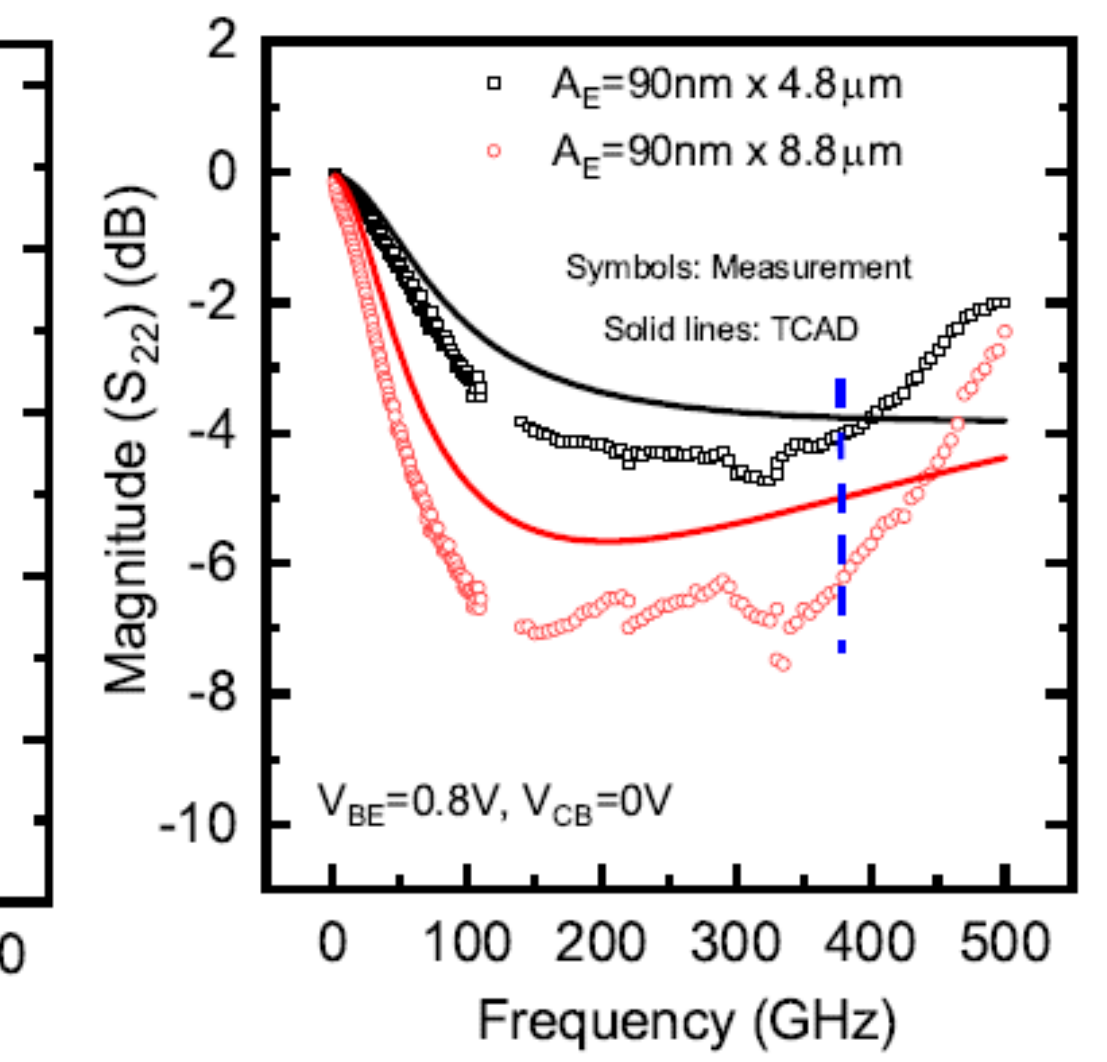
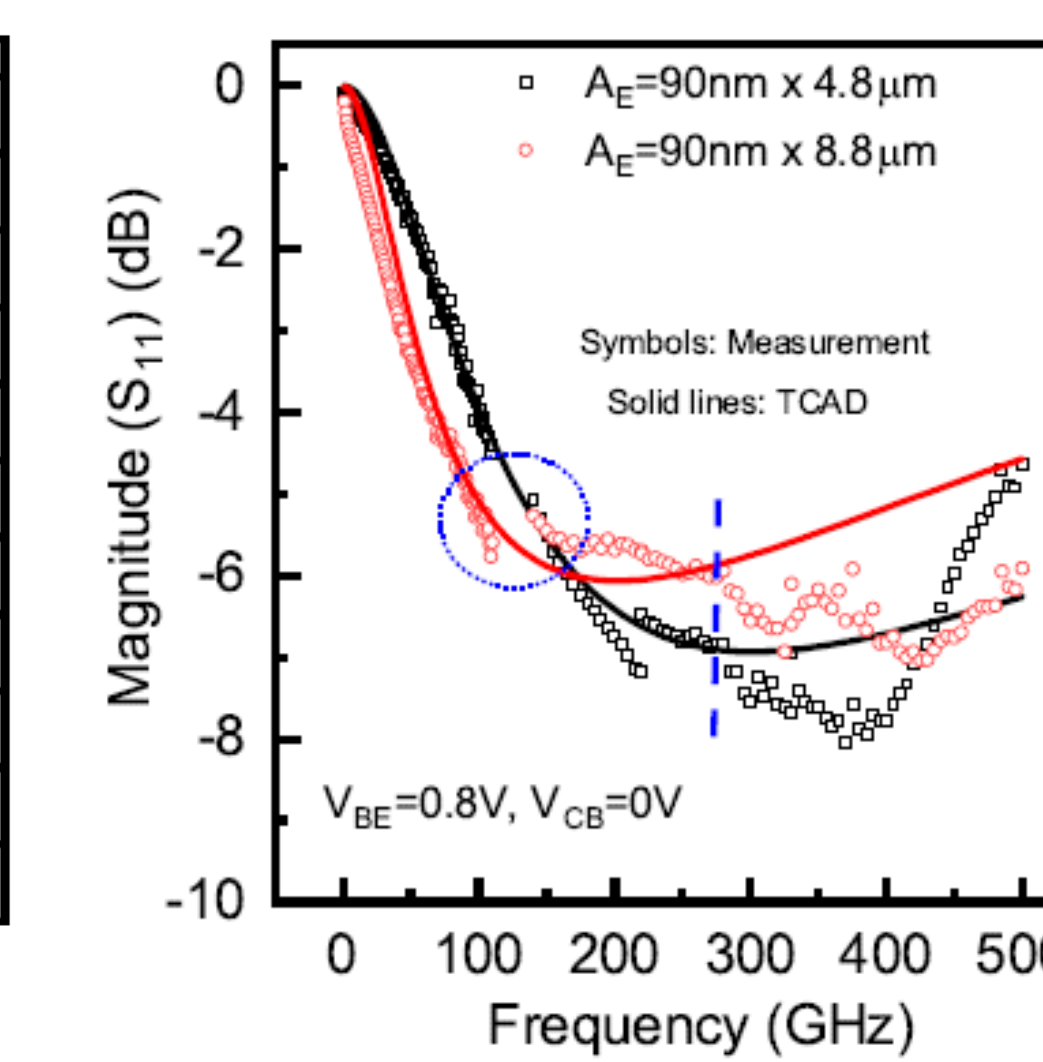
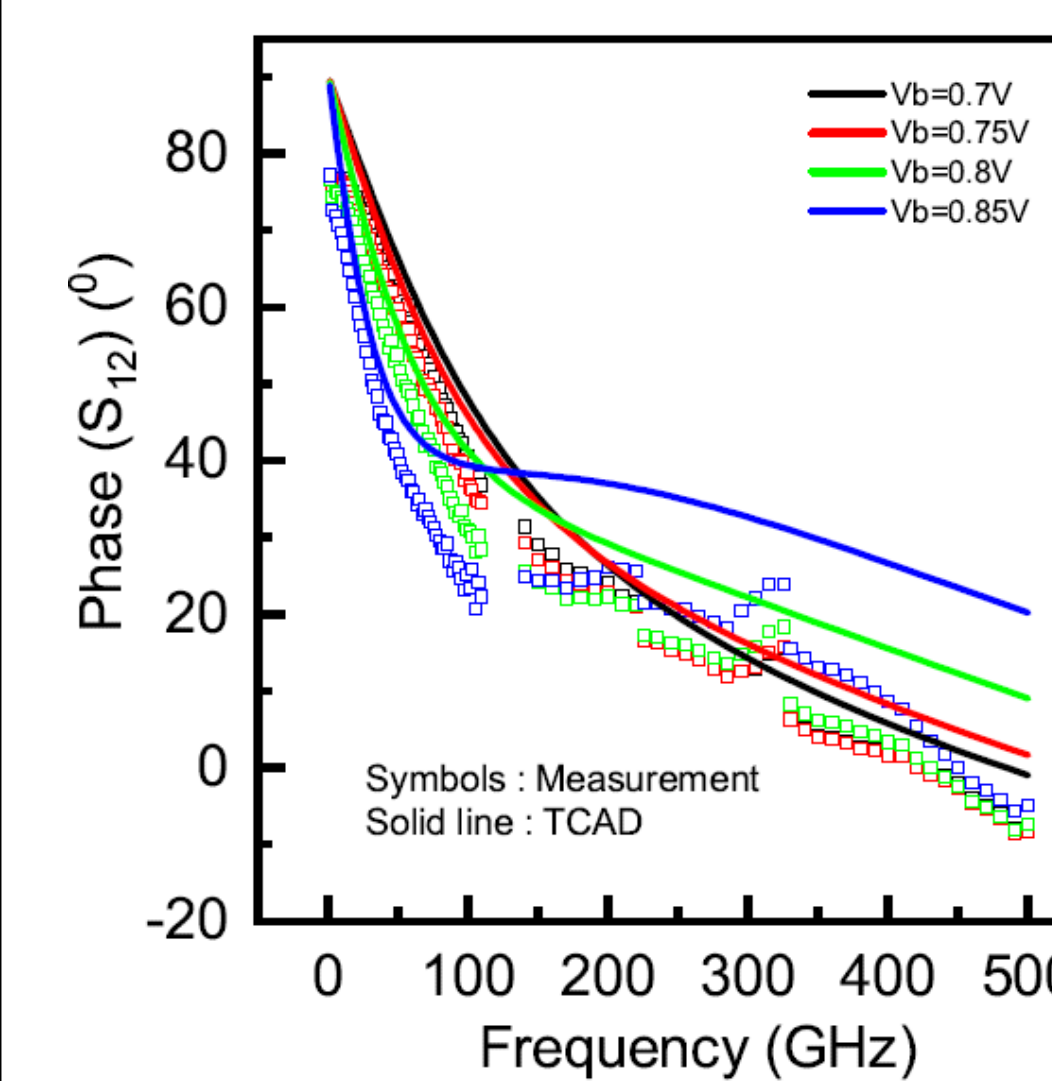
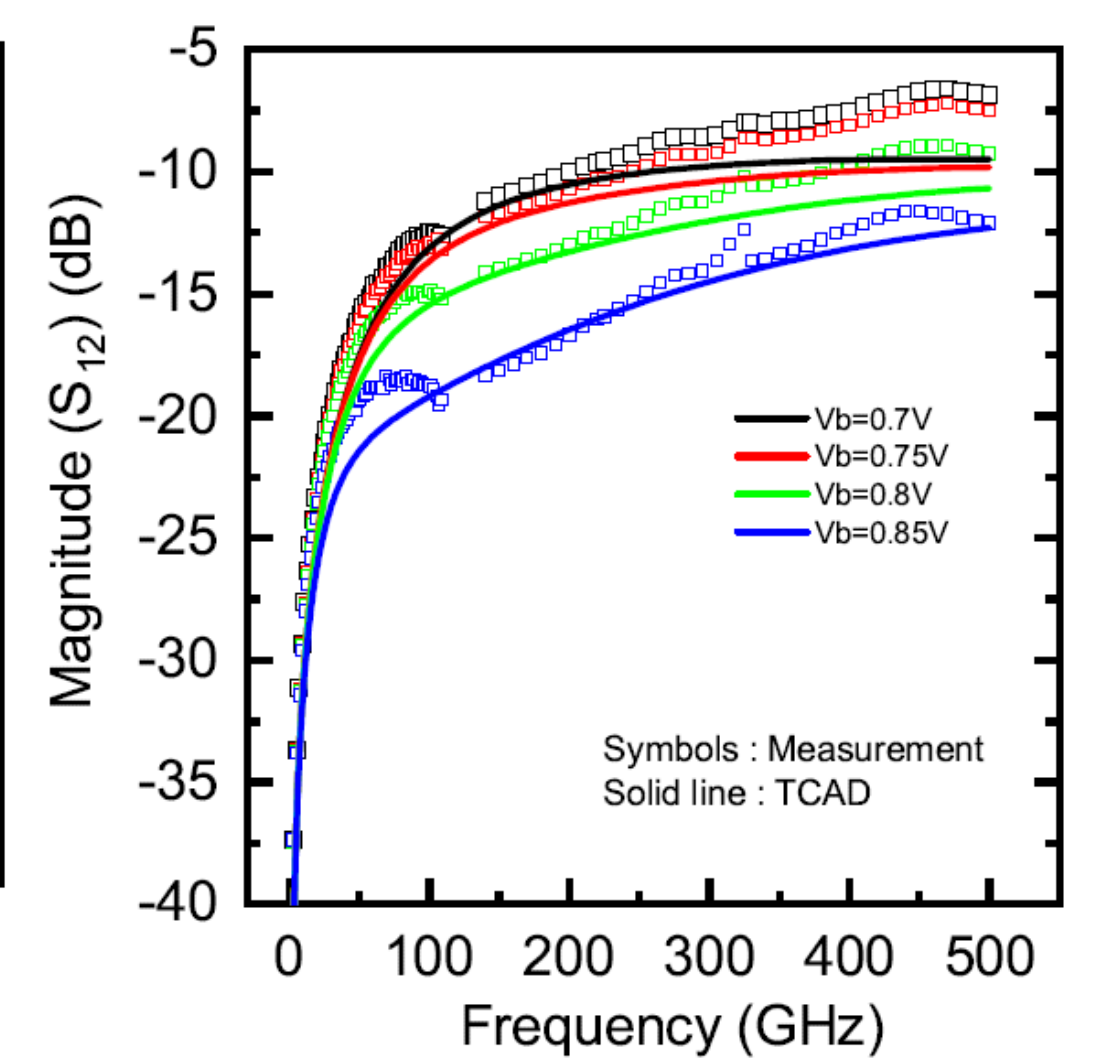
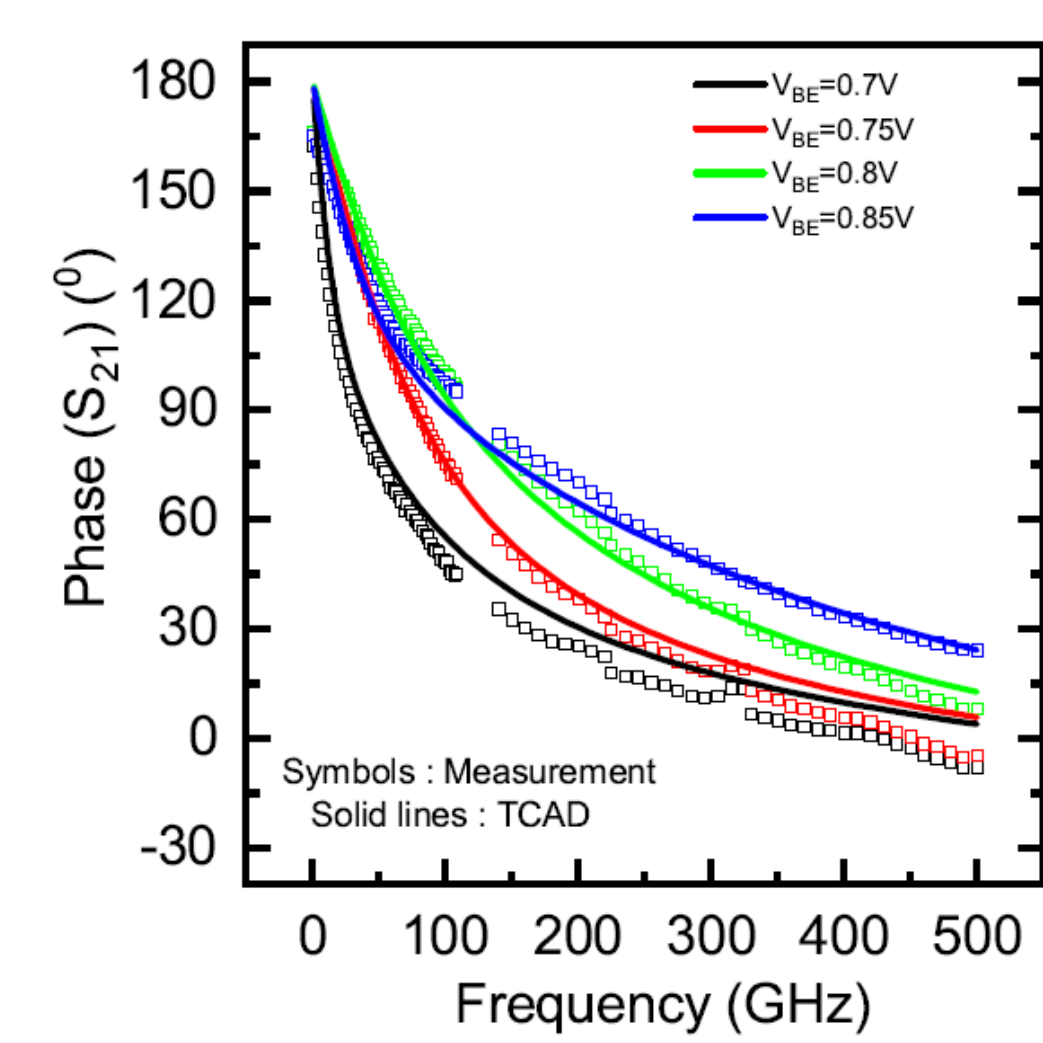
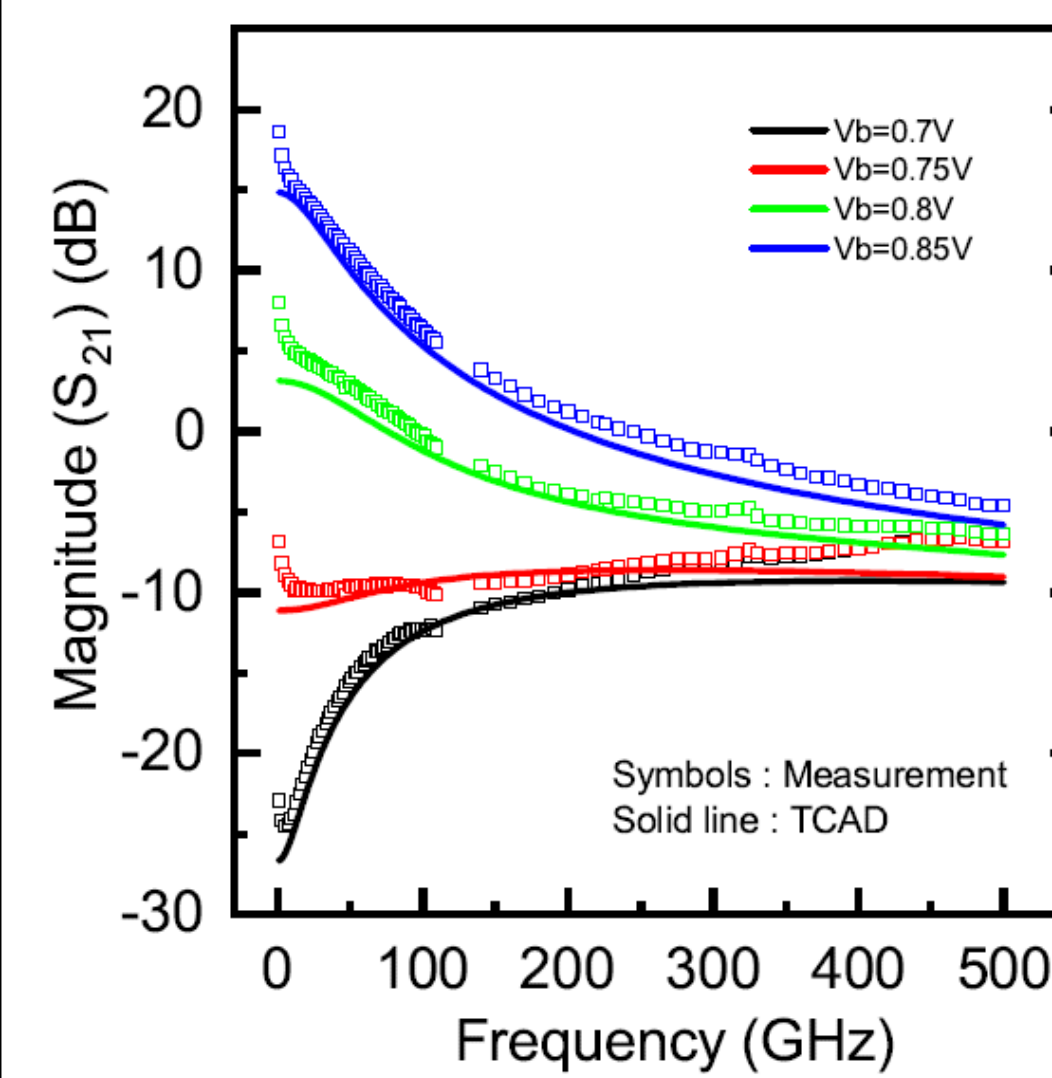
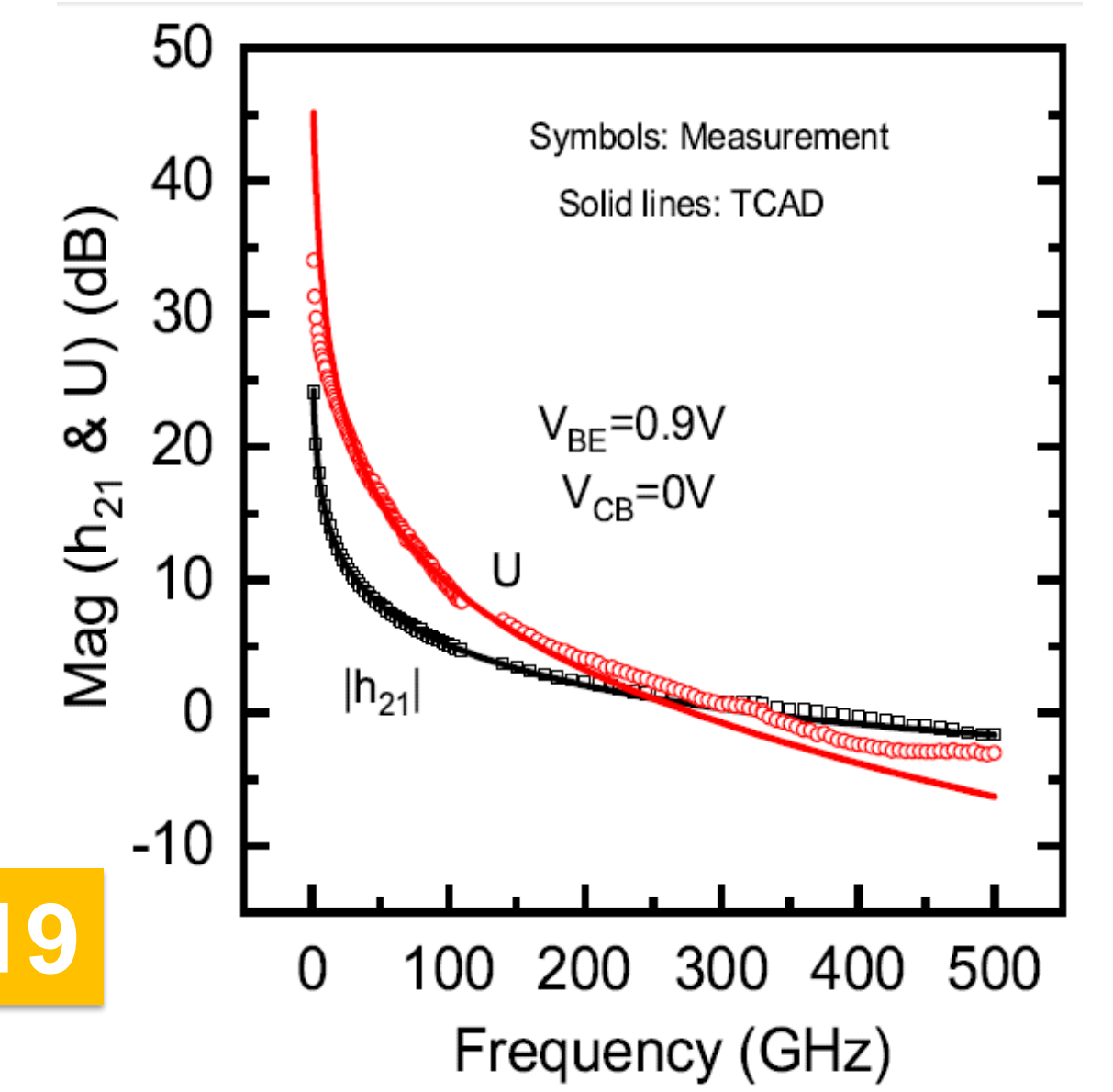


1. Device geometry as captured in the TEM image is reproduced in TCAD and simulated using verified models.
2. The device FoM are calibrated comparing with measurements.

Results



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The comparisons are done w.r.t bias variation and device dimension variation.

Conclusions

1. No clear upper frequency limit up to which the measurements are representing the intrinsic transistor (after de-embedding).
2. An urgent need for improvement of test structure design, calibration methodologies and de-embedding procedures when entering the THz domain.

Acknowledgement

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