

A novel PoISK Transceiver Based on Differential Demodulation: Assessment of Performance

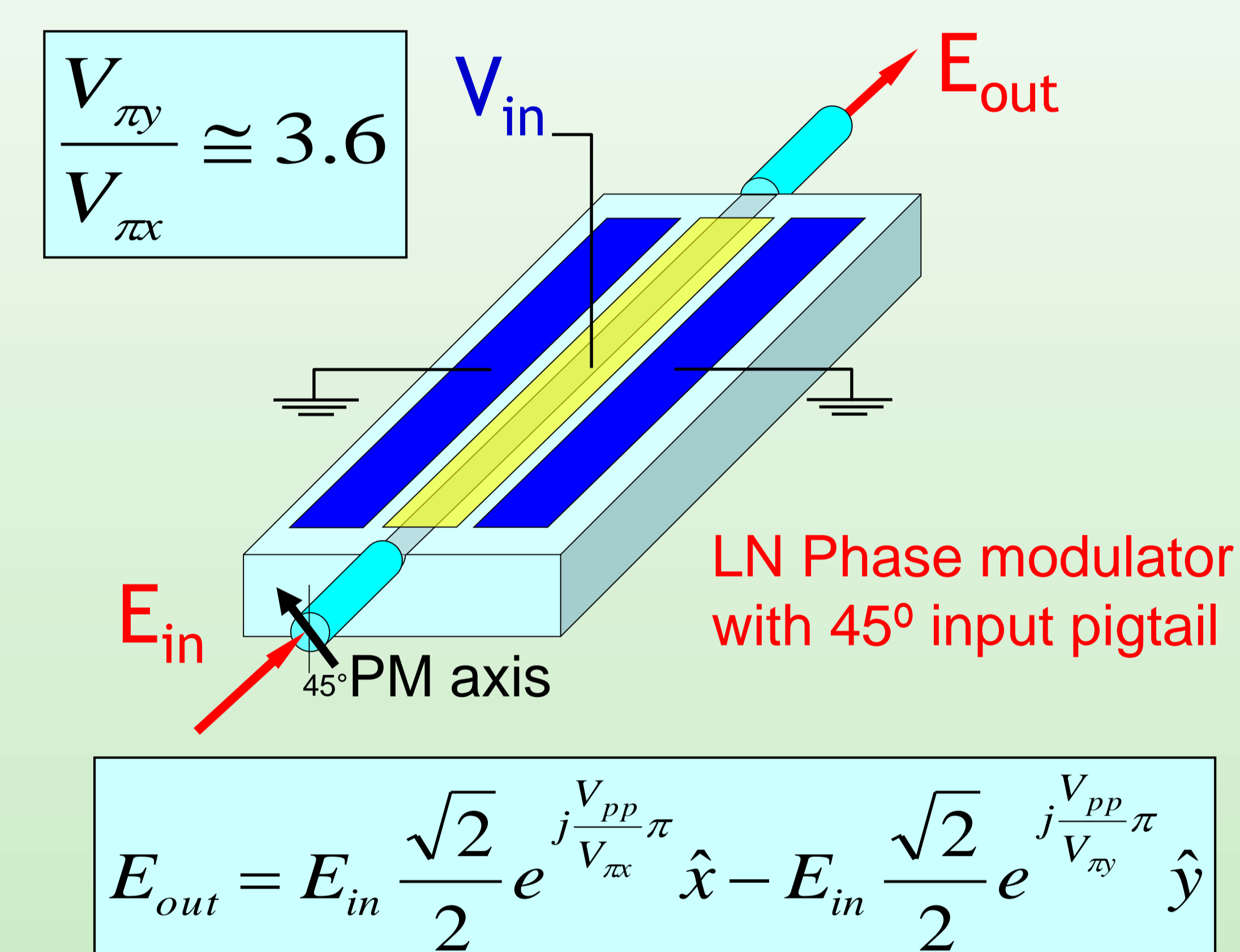
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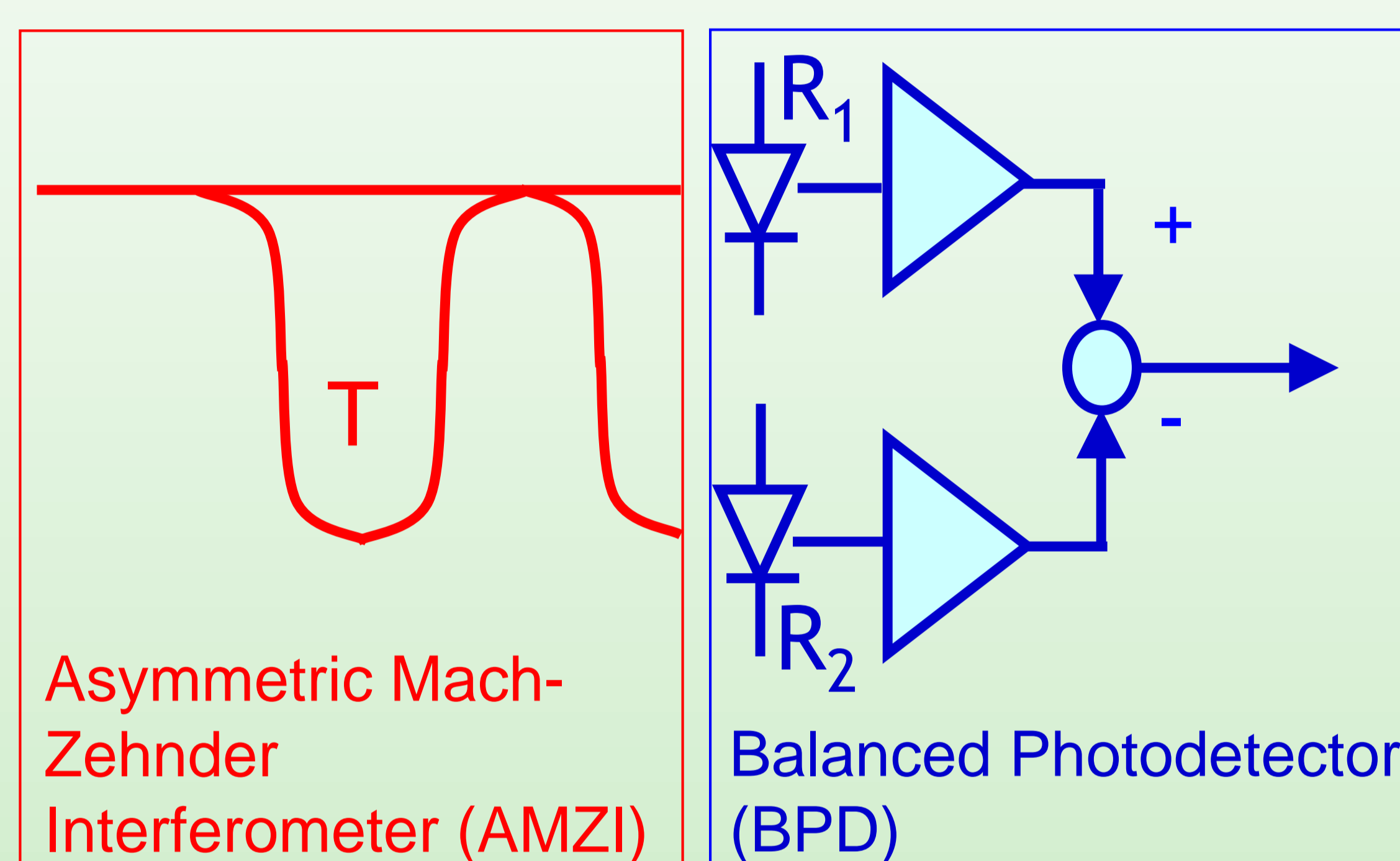


Abstract - We present simulation and experimental results on PoISK modulation based on simple transmitter and receiver setups, using, for the first time to our knowledge, a differential demodulation based on the asymmetric Mach-Zehnder interferometer.

Transmitter

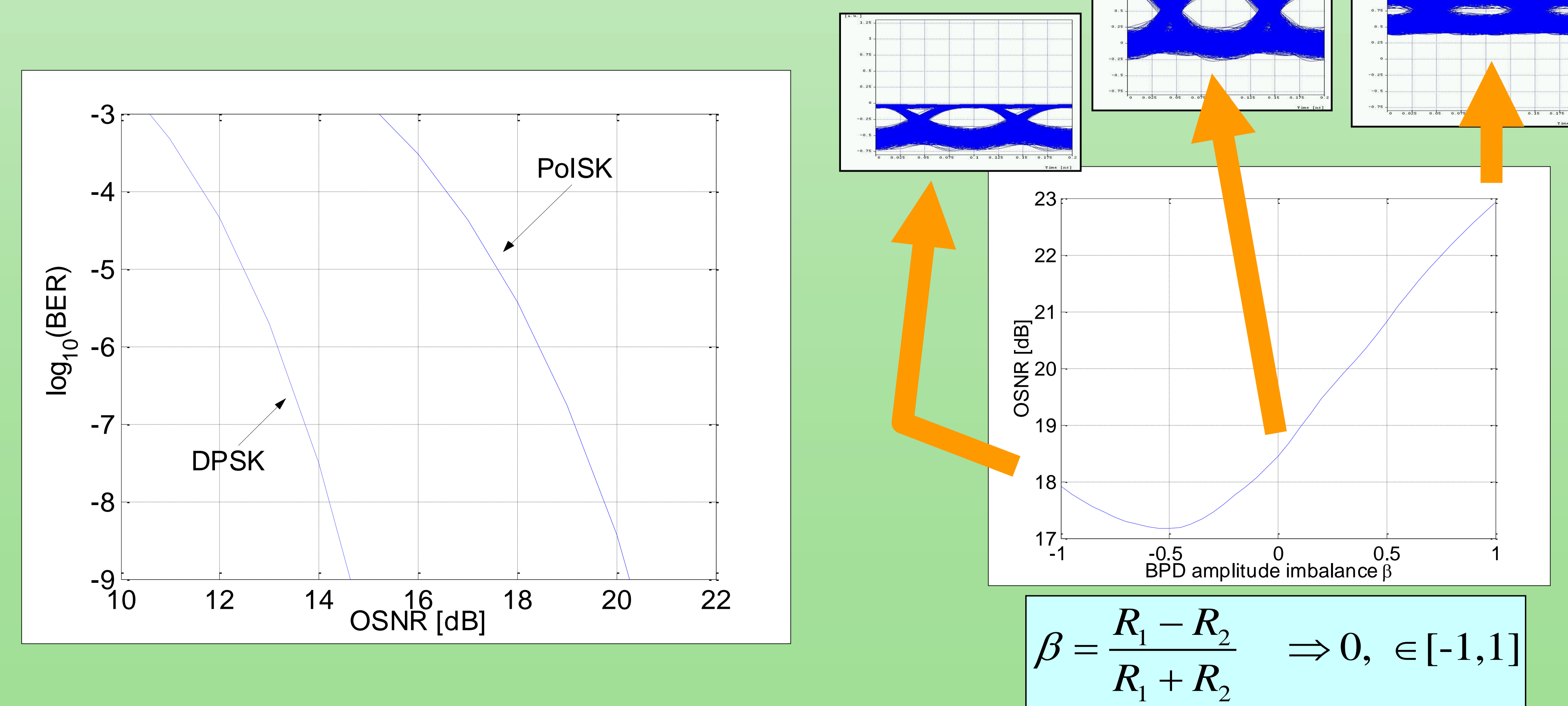


Receiver

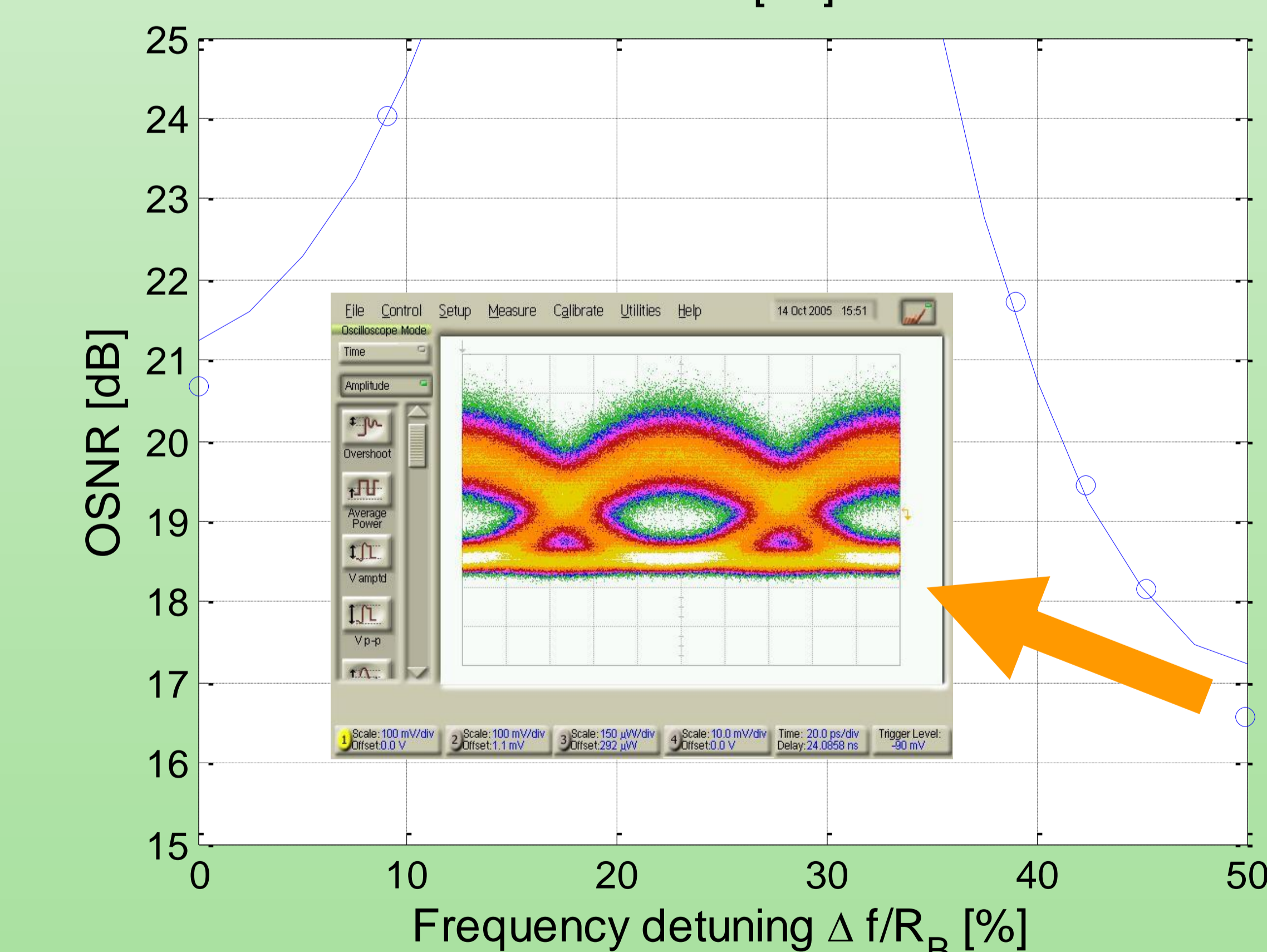
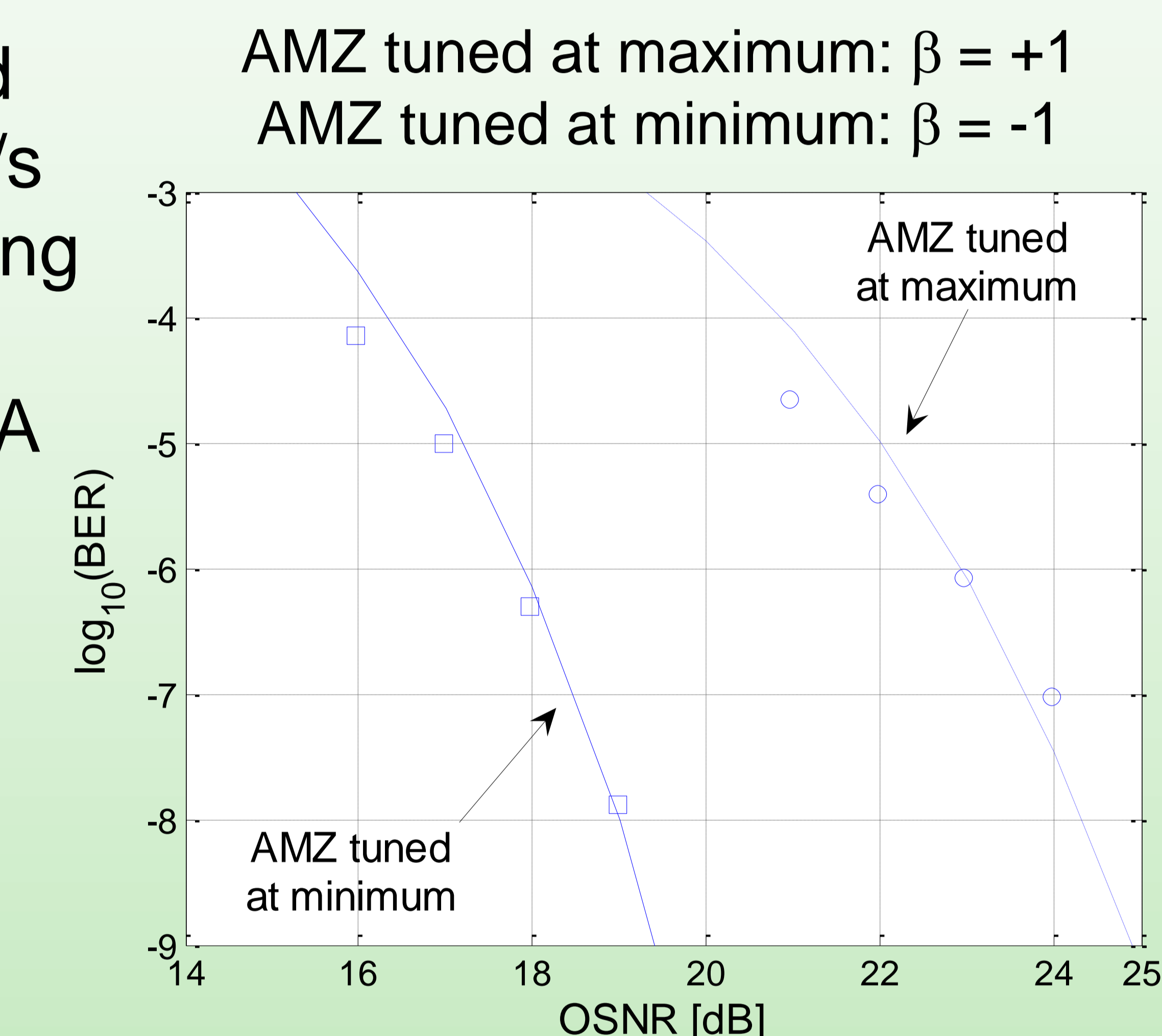
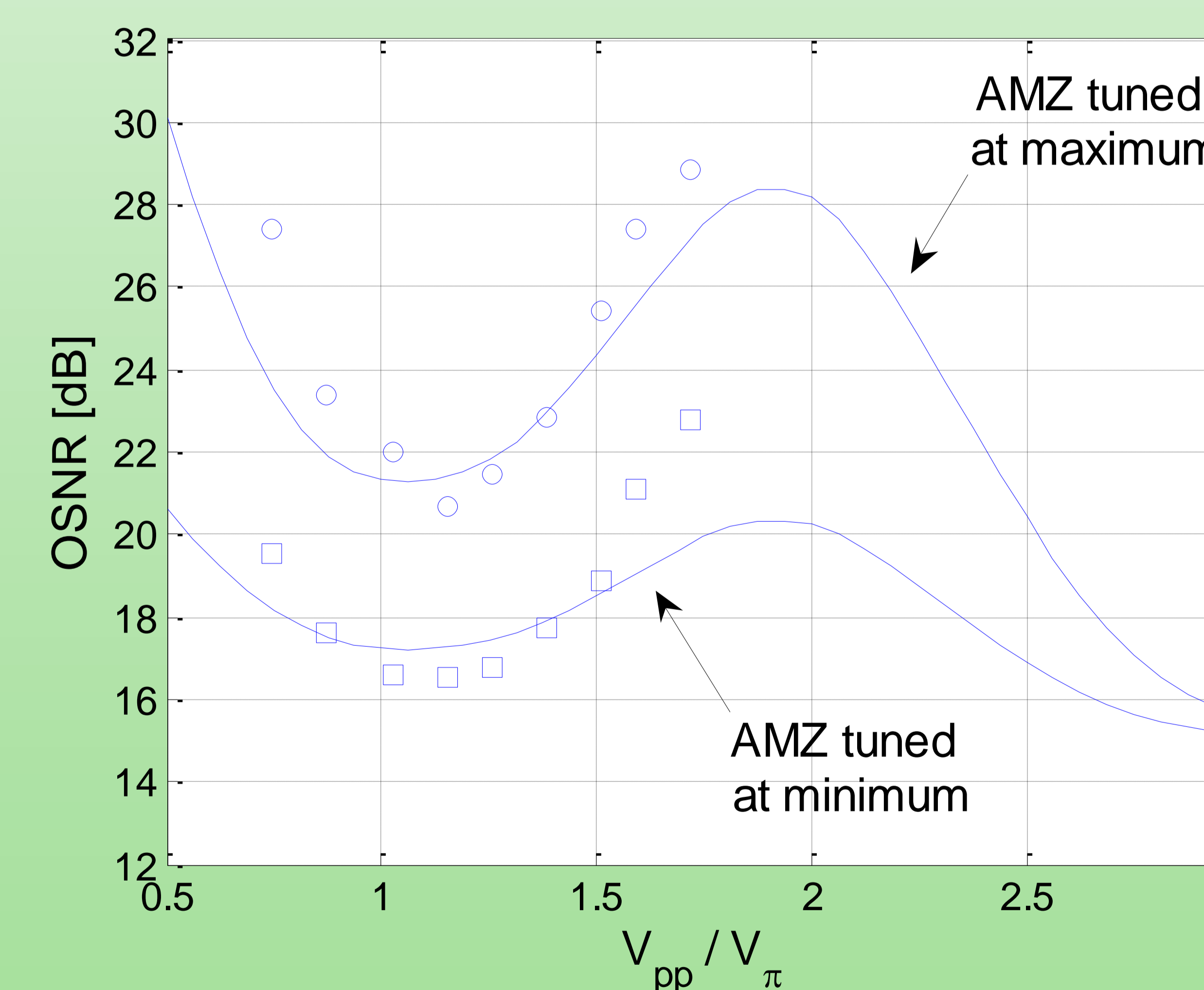
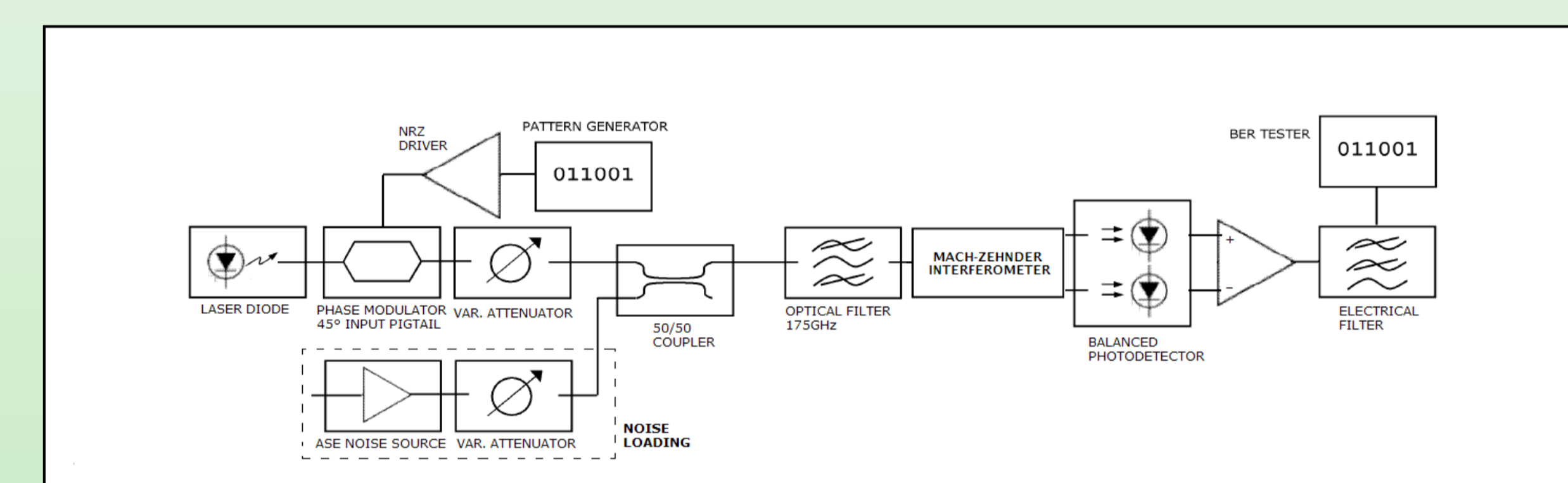


No need for a polarization control !!

Simulation results - We used a semi-analytical technique based on the Karhunen-Loève series expansion of noise and signal in order to accurately evaluate system performance.



Experimental results - We performed back-to-back measurements at 10 Gbit/s using a noise loading technique sweeping OSNR values. A wide 175 GHz optical filter together with a single-end PIN+TIA receiver has been used.



Conclusions - When using differential demodulation with PoISK, the single-ended receiver has a better performance than the balanced one. Moreover, a mixed polarization-phase modulation can further gain more than 1 dB in sensitivity.