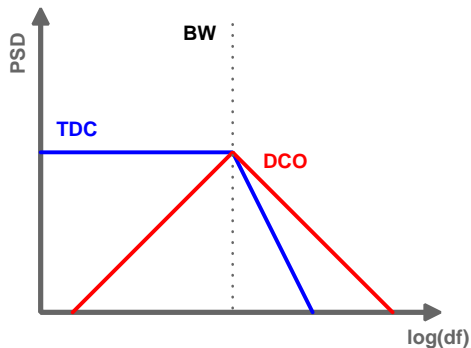


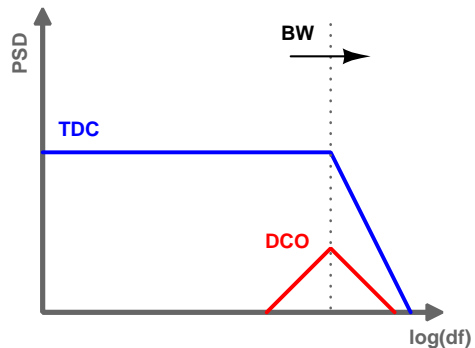
### Decreasing bandwidth

- Increasing phase noise, DCO-dominated
- Slow/increasing lock time



### Optimal bandwidth

- Minimum phase noise
- Equal contributions
- Moderate lock time



### Increasing bandwidth

- Increasing phase noise
- TDC-dominated
- Fast/decreasing lock time