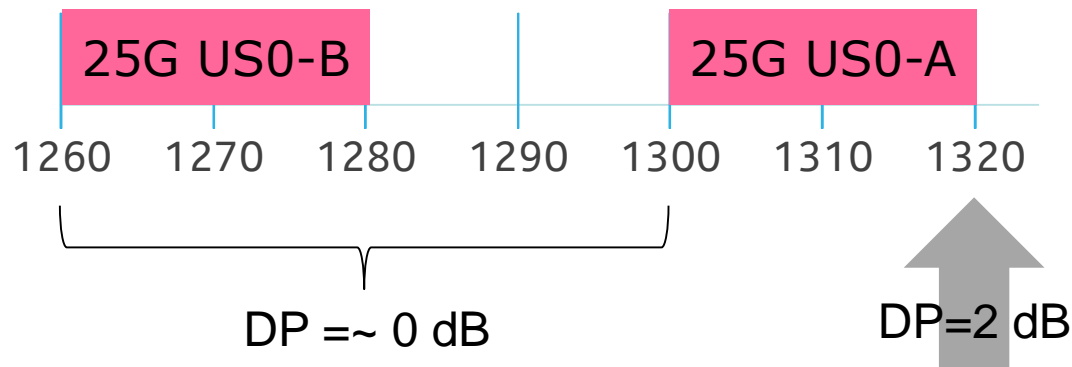# Upstream wavelength plan

- Ed Harstead, Nokia
- …

Upstream dispersion penalties
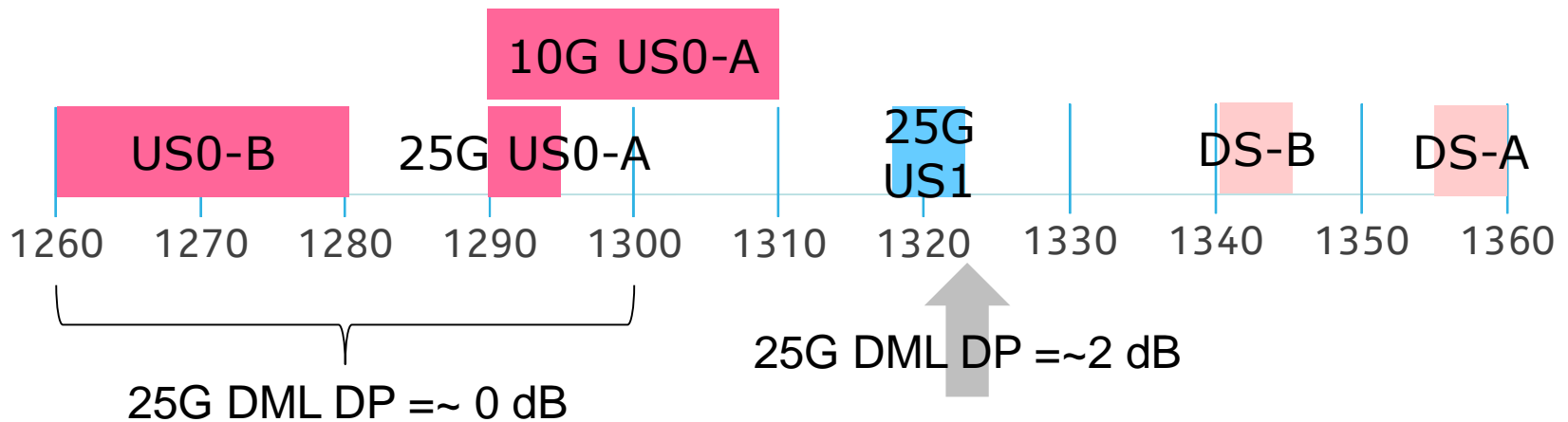
❑ From harstead_3ca_2a_1117: For a DML, there is a strong dependence of dispersion penalty (DP) on wavelength.

Worst dispersion penalty at 25G for DML

25G US0-B				25G US0-A	
1260	1270	1280	1290	1300	1310	1320

DP =~ 0 dB

DP=2 dB

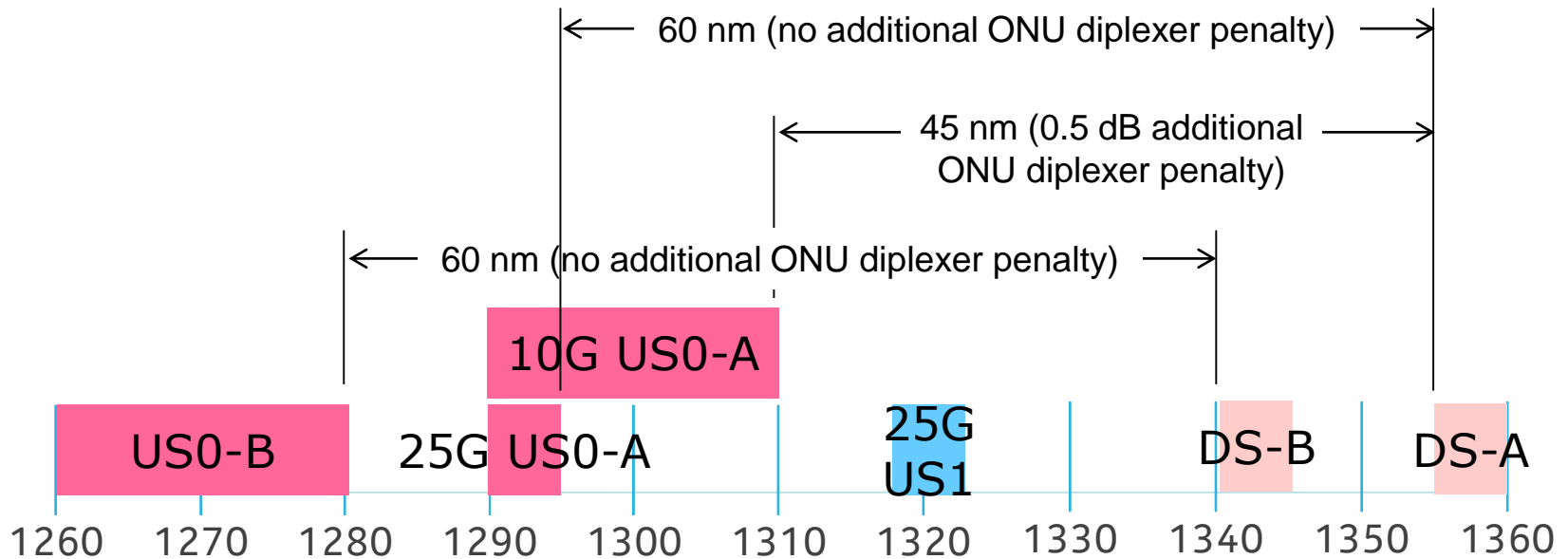❑ To obtain the same DP=0 for 25G US0-A, we can restrict its wavelength range to be ≤1300 nm

Dispersion-optimized US wavelength plan

- DML DP ~0 dB for 25G US0-A, to be equivalent to 25G US0-B.
- Keep 20 nm for 10G US0-A: allows uncooled DMLs in 25/10 ONUs using US0-A.
- The burden of DP=2 dB is deferred until 2x25G EPON

- ❏ US0-B ONUs:
  - – Both 25/10 and 25/25 ONUs have a 60 nm DS/US gap and therefore no diplexer penalty
- ❏ US0-A ONUs:
  - – 25/25 ONUs have a 60 nm DS/US gap and therefore no diplexer penalty
  - – 25/10 ONUs have a 45 nm DS/US gap and a 0.5 dB diplexer penalty. The 10G ONU transmitter may absorb this penalty in the US. The 25G ONU receiver may be required to absorb this penalty in the DS.

References

❑ DML dispersion penalties per umeda_3ca_1_1117 (interpolate for intermediate values), liu_3ca_1_0917 and liu_3ca_2_0118.

❑ 25G ONU optical module diplexer penalties per funada_3ca_1_0117