Proposal of 100G EPON wavelength plan in O-band

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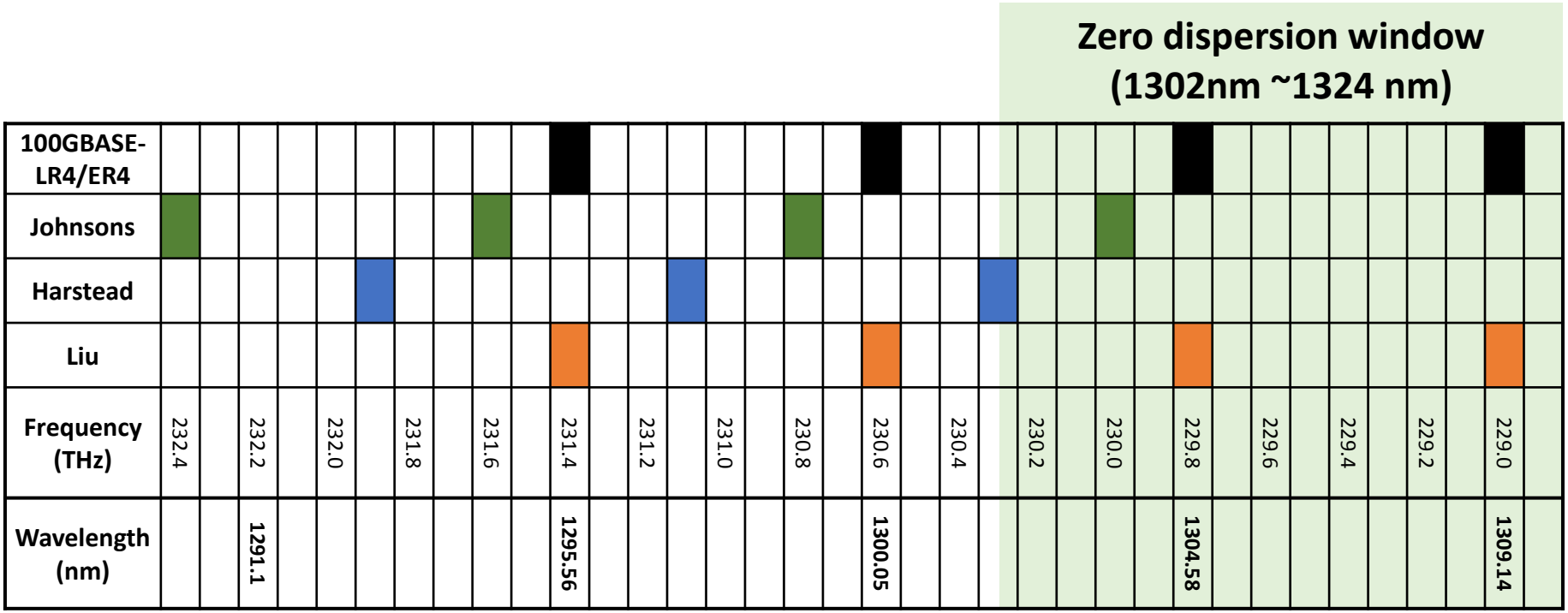
Motivation

- Several O-band upstream wavelength plans were proposed in the last meeting
  - johnson_3ca_1_0916.pdf
  - harstead_3ca_2_0916.pdf
  - liu_3ca_1_0916.pdf
- Most of the wavelength plan contributions proposed 800 GHz channel spacing for upstream signals considering a low cost DML based transmitter
- Reusing 100G Ethernet optics is a good way to decrease the cost of optical transceiver and wavelength MUX
- In the point of transmission performance, the upstream wavelength should avoid an overlap with zero dispersion window (1302 nm ~ 1324 nm) to minimize four wave mixing between upstream signals

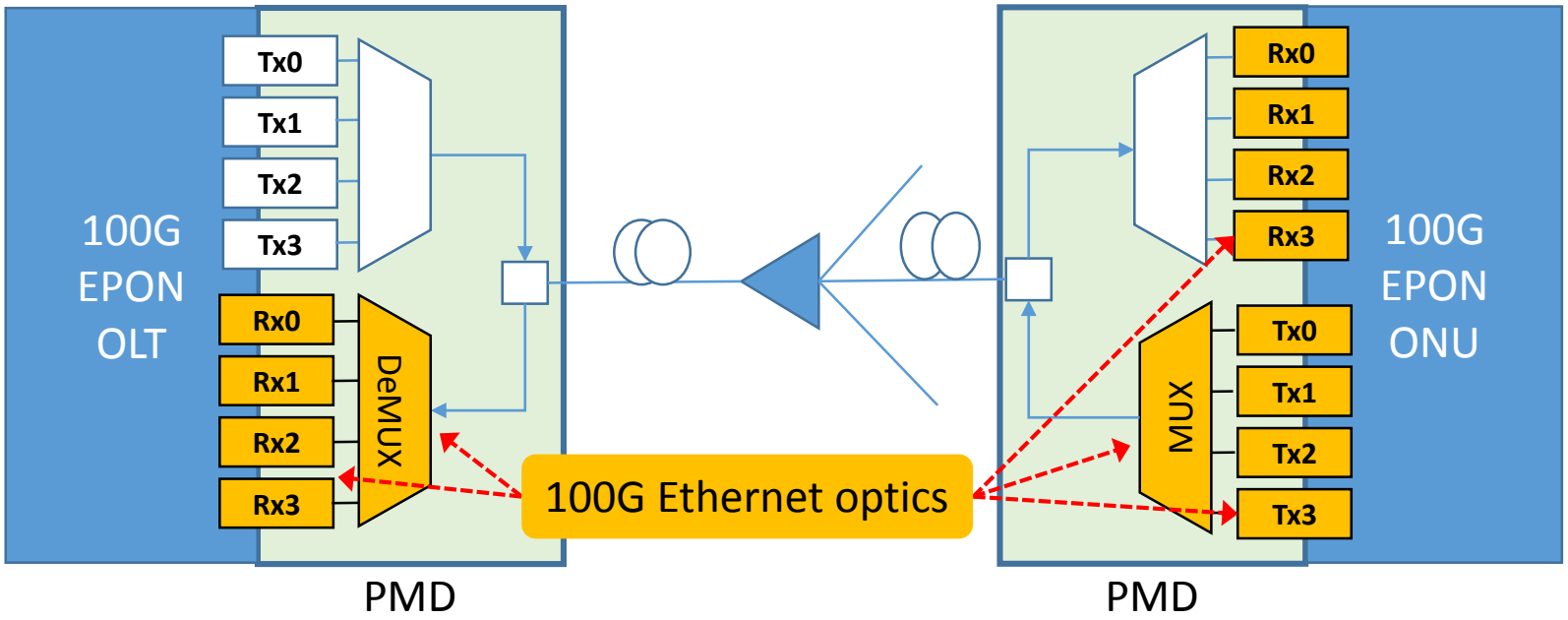
Wavelength summary



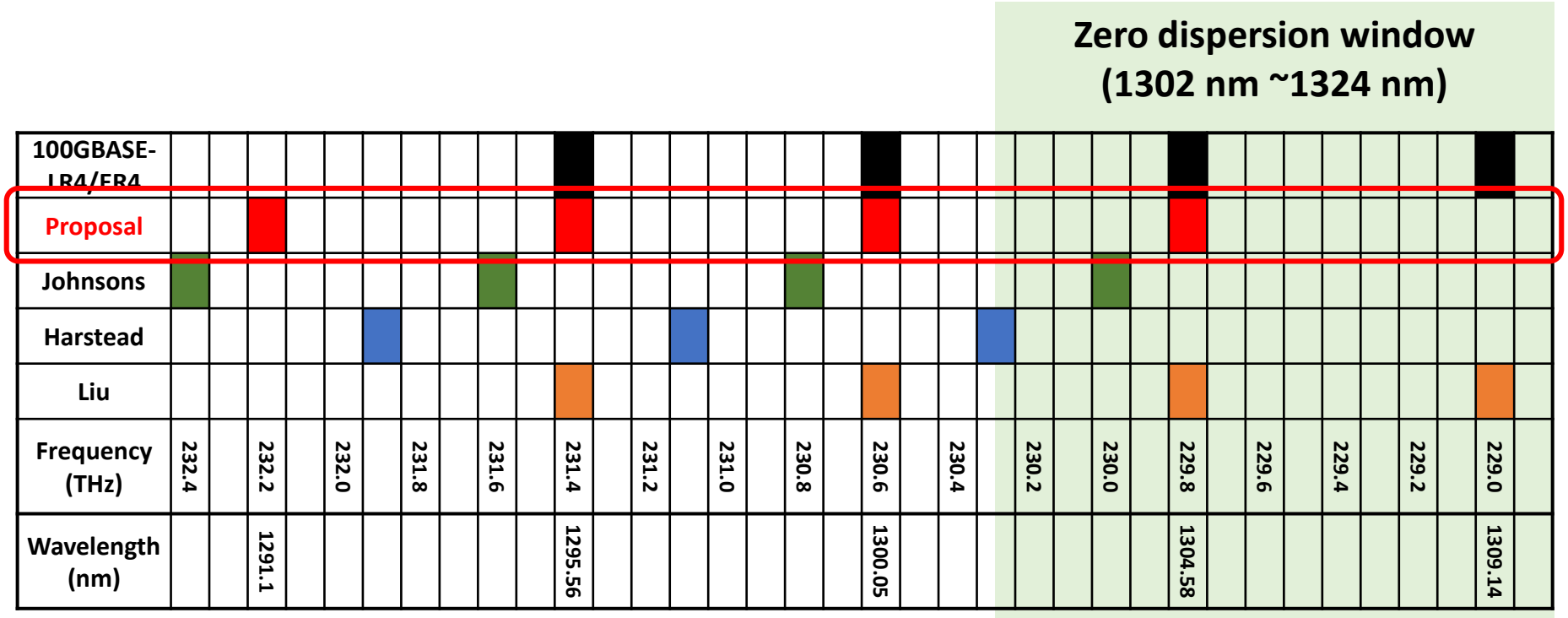
- Three proposed wavelength plans were near 1300 nm, but not identical since there were different considerations about FWM, optical filter design, laser cost and so on

Eco-system with 100G Ethernet

- In deciding the upstream wavelength plan, the cost of optics such as lasers, optical filters and receivers must be a major consideration.
- It is clear that there will be a cost advantage if 100G EPON optics can use existing optics for 100G Ethernet optics

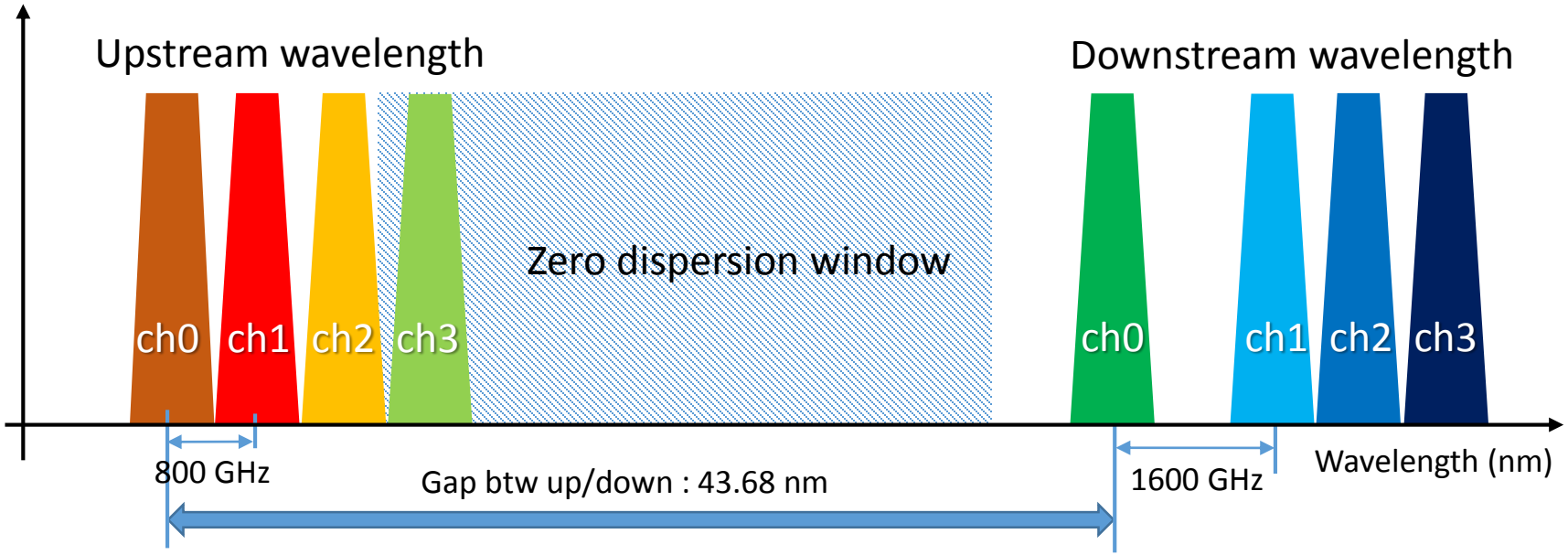


Proposed upstream wavelength



- DML is preferable to implement low-cost ONU → Low dispersion window
- Current 100GBASE-LR4/ER4 wavelength plan may suffer FWM penalty
- To maximize reuse of existing 100G Ethernet optics, we proposed a wavelength plan shifted by 800 GHz toward short wavelength

Proposed up/down wavelength plan



	Ch0	Ch1	Ch2	Ch3	Note
Upstream (nm)	1291.10	1295.56	1300.05	1304.58	
Downstream (nm)	1334.78	1344.36	1349.20	1354.08	Same wavelength plan with johnson_3ca_1_0916
Gap btw up/down (nm)	43.68	48.8	49.15	49.5	Large enough to Implement low-cost BOSA in ONU

Conclusion

- We proposed 100G EPON upstream and downstream wavelength plans
- The upstream wavelengths were shifted by 800 GHz toward short wavelength from 100G Ethernet wavelength