Optical network issues in MEUST

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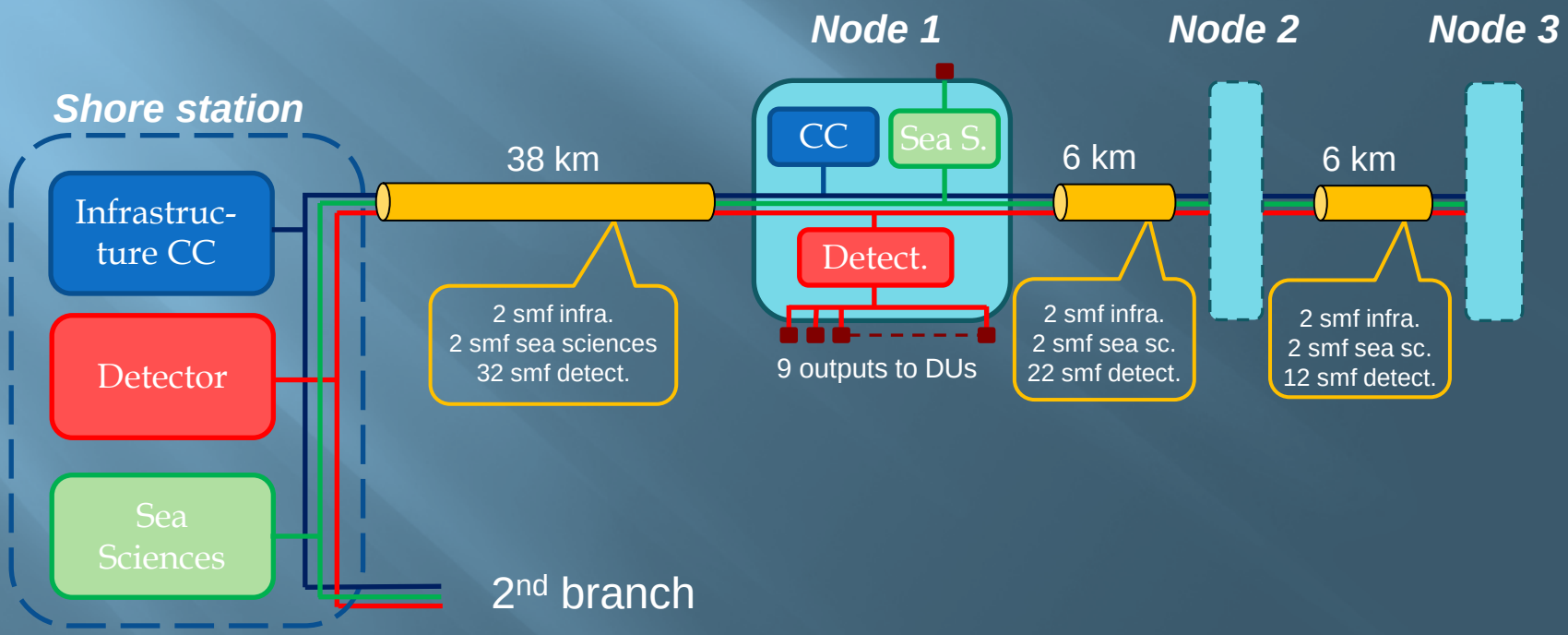
Network constraints

- MEOC with 36 optical fibres
  - 4 fibres for CC and Sea Sciences
  - Up to 32 fibres available for the detector network for node 1
- Node in series
- Node designed for a life time of 15 years
- 4 DUs connected in series from one node user port (Up to 5 wet-met connectors in series)
- Optical components for the detector to be integrated in the node (definition, availability…)

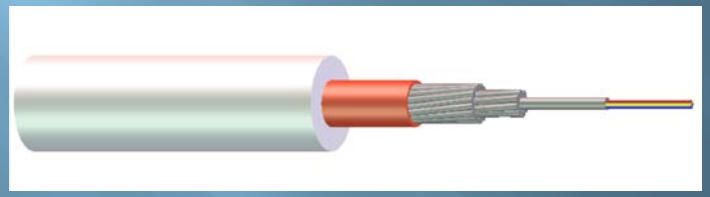
Optical network overview

- 3 independent networks:
  - Infrastructure CC
  - Sea science
  - KM3NeT detector (*main focus of this talk*)



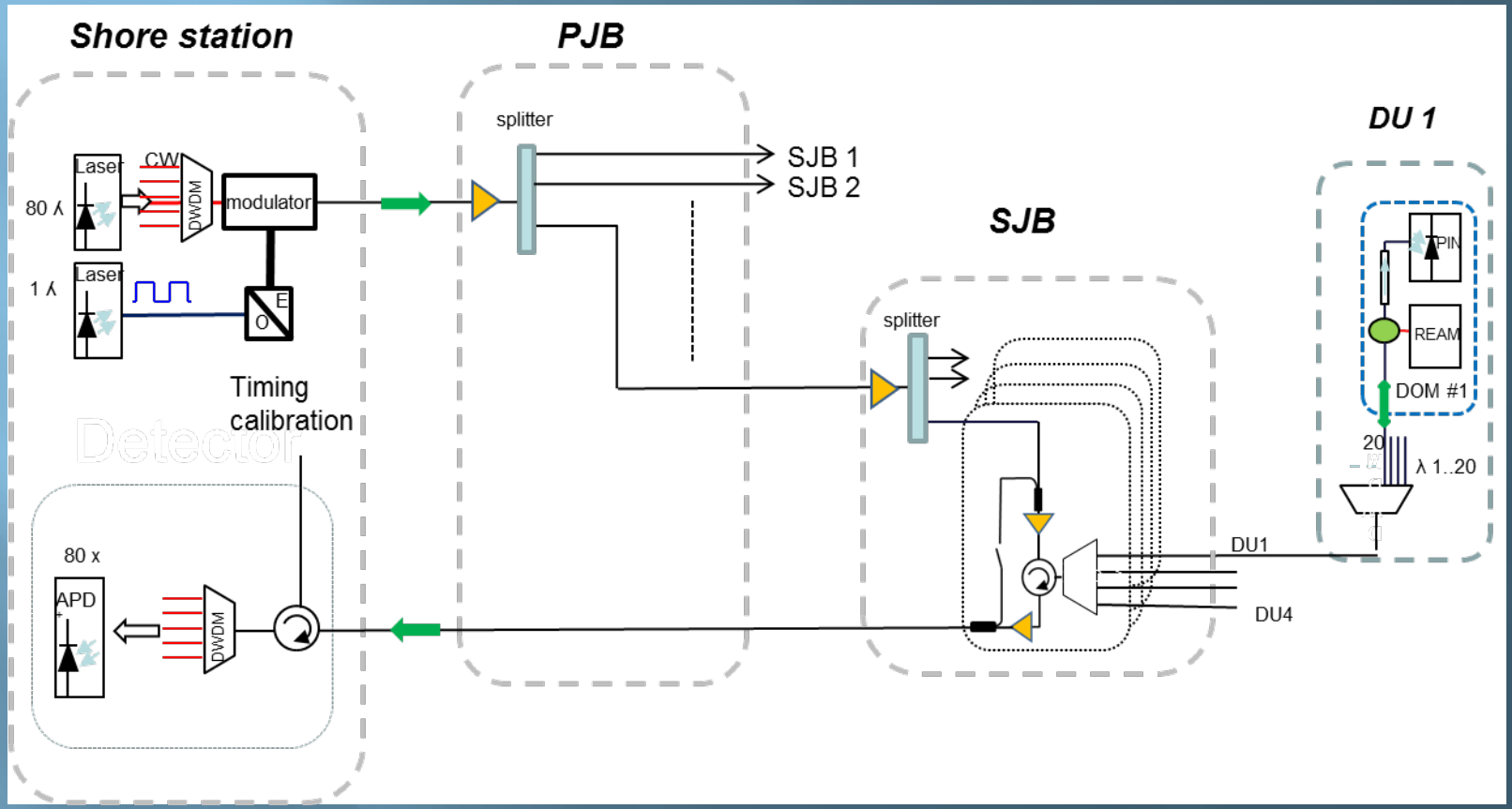
MEOC cable

- Cable ordered to Alcatel reference OALC-7
- 36 LEAF-EP fibres
- Cable under manufacture



Fibre type	LEAF EP (NZDSF G655)
Typical CD (ps/nm/km) @ 1550nm & 20°C	- 4.0
Zero Dispersion temperature coefficient	0.03nm/°C
Typical Dispersion slope @ 1550nm (ps/nm^2/km)	0.123
Typical core effective area (μm^2) @ 1550nm	68
Typical Mode field diameter (μm) @ 1550 nm	9.2
Effective refractive index	1.470
Non linear parameter n2 @ 1550nm (10^{-20} m^2/W)	2.5
Cable Cut - off λ_{cc} (nm)	< 1520
Fibre diameter (μm)	125 ± 1
Core Concentricity error (μm)	≤ 0.6
Fibre non-circularity (%)	< 2
Coating diameter (μm)	250 ± 5
Local attenuation discontinuity (dB)	< 0.1
Typical PMD (ps/km$^{1/2}$) @ 1550nm	≤0.15
Proof Test (kpsi)	≥ 200

KM3NeT optical scheme

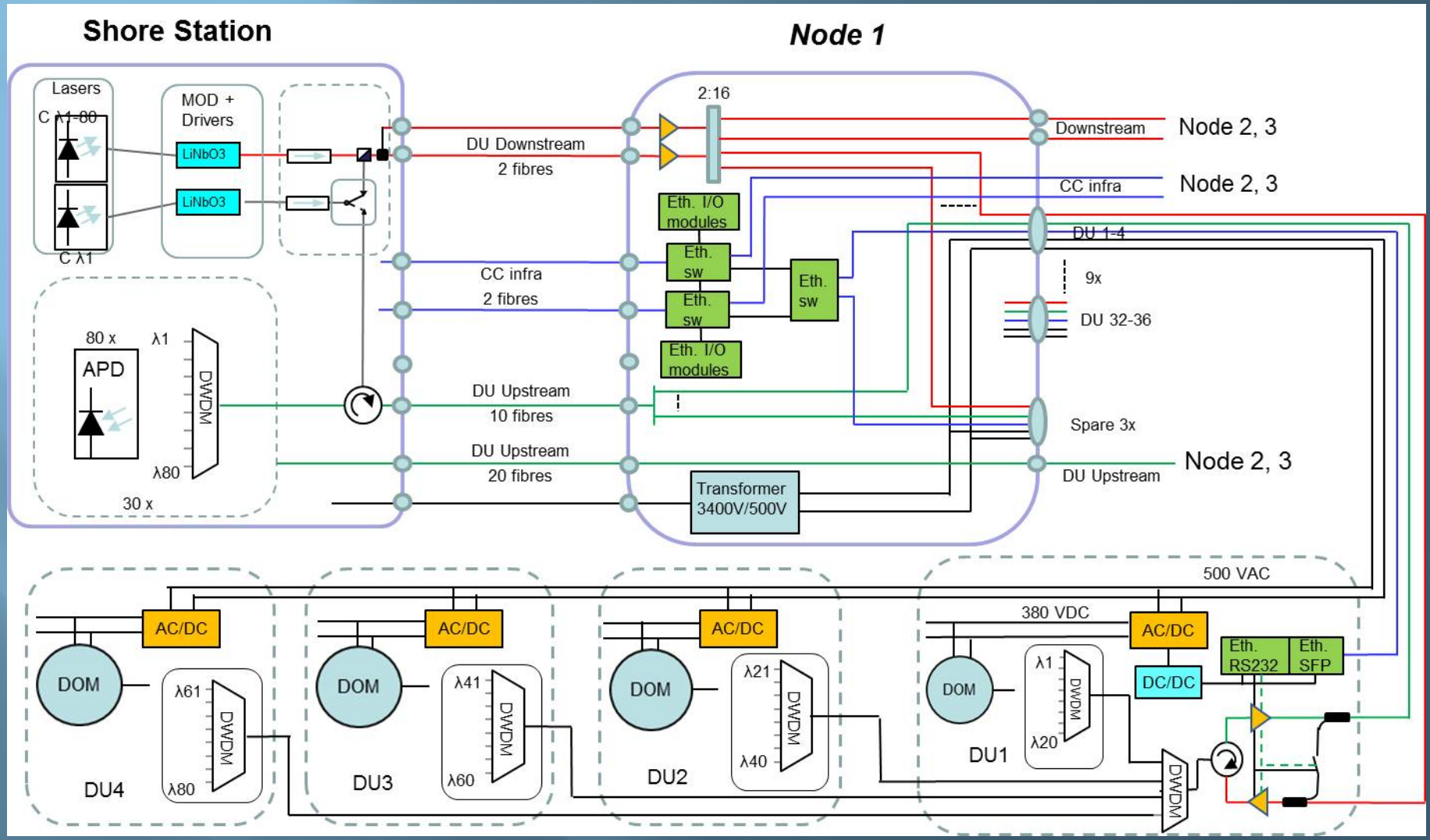


Transposition in MEUST

- To minimize active components in the node
- To minimize the dependence of the DUs optical network definition on the node development (different time scale)
- To allow network adaptation (before deployment!!!)
- Some parts moved from node to DU

Possible implementation in MEUST

Very preliminary proposal, several issues to solve



Main issues to solve

- Definition of DU optical network
- Definition of components to be integrated in the node
- Validation of the DU in series concept

Answers needed urgently to finalize the design of the node

Summary

- Construction of the infrastructure underway
- Design done to be flexible… with some limits!!!
- Several issues to be solved

Critical items:

- For infrastructure development
  - DU optical network
  - Validation of DUs in series