



Latest Innovations in Components and Systems for CBC and SBC

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5 October 2026. 15:00 - 17:00 CEST

EPIC Online Technology Meeting on
Laser for Defense Applications

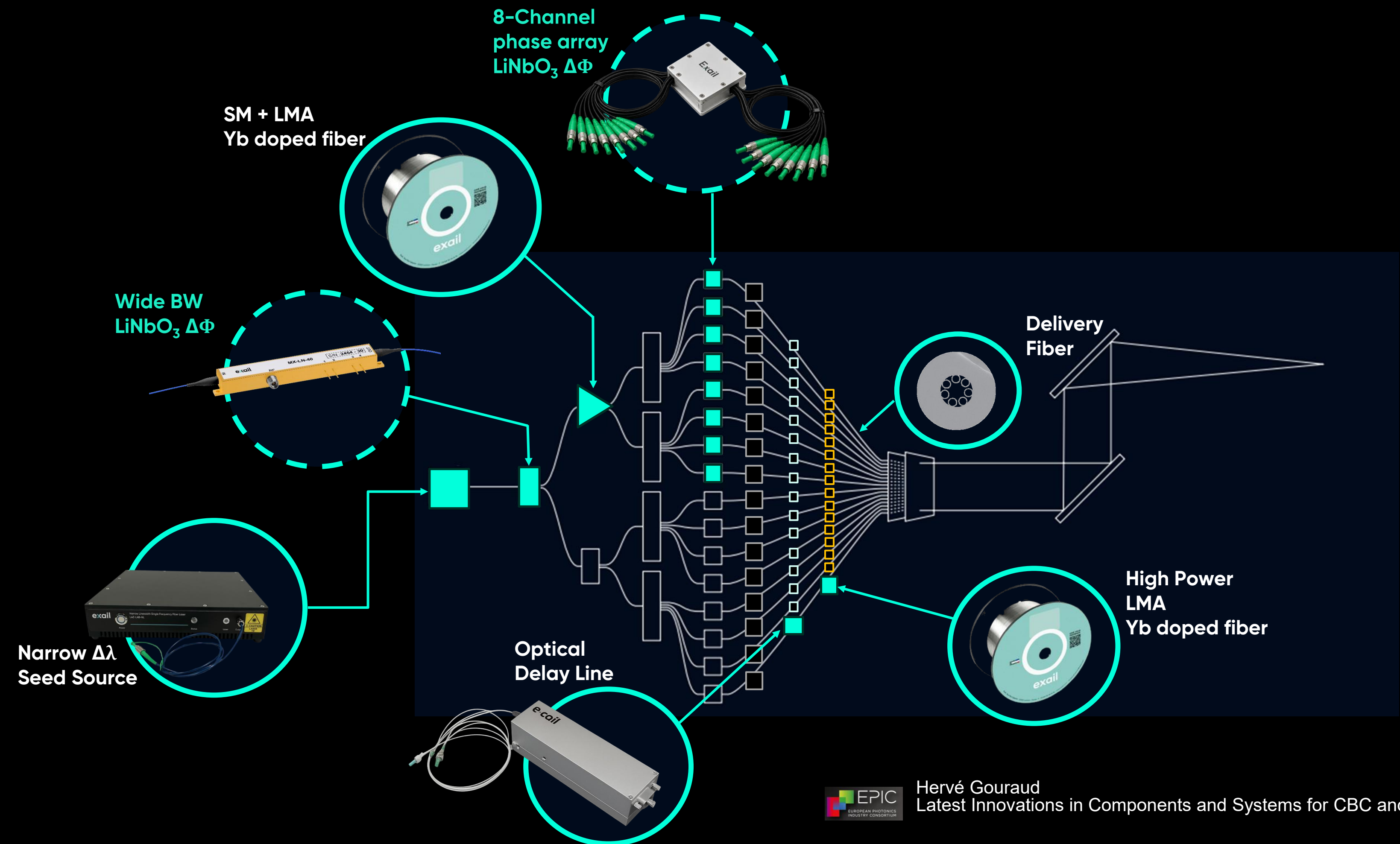
EPIC
EUROPEAN PHOTONICS
INDUSTRY CONSORTIUM

The banner features a background image of a naval ship at sea, with a drone in the sky and laser beams connecting various points. The text is overlaid on a red and white background.

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Globally-proven partner for Directed Energy components





Exail – Leading European manufacturer of photonic components and systems for CBC & SBC Lasers Architecture

8-Channel Low-Frequency Electro-Optic Phase Modulator Array

for Phase Control & Locking

in CBC Lasers Architecture

8-Channel Low-Frequency Phase Modulator Array: A Breakthrough in Phase Control

➤ 8CH-NIR-MPX-LN-0.1:

8-Channel Low-Frequency Phase Modulator

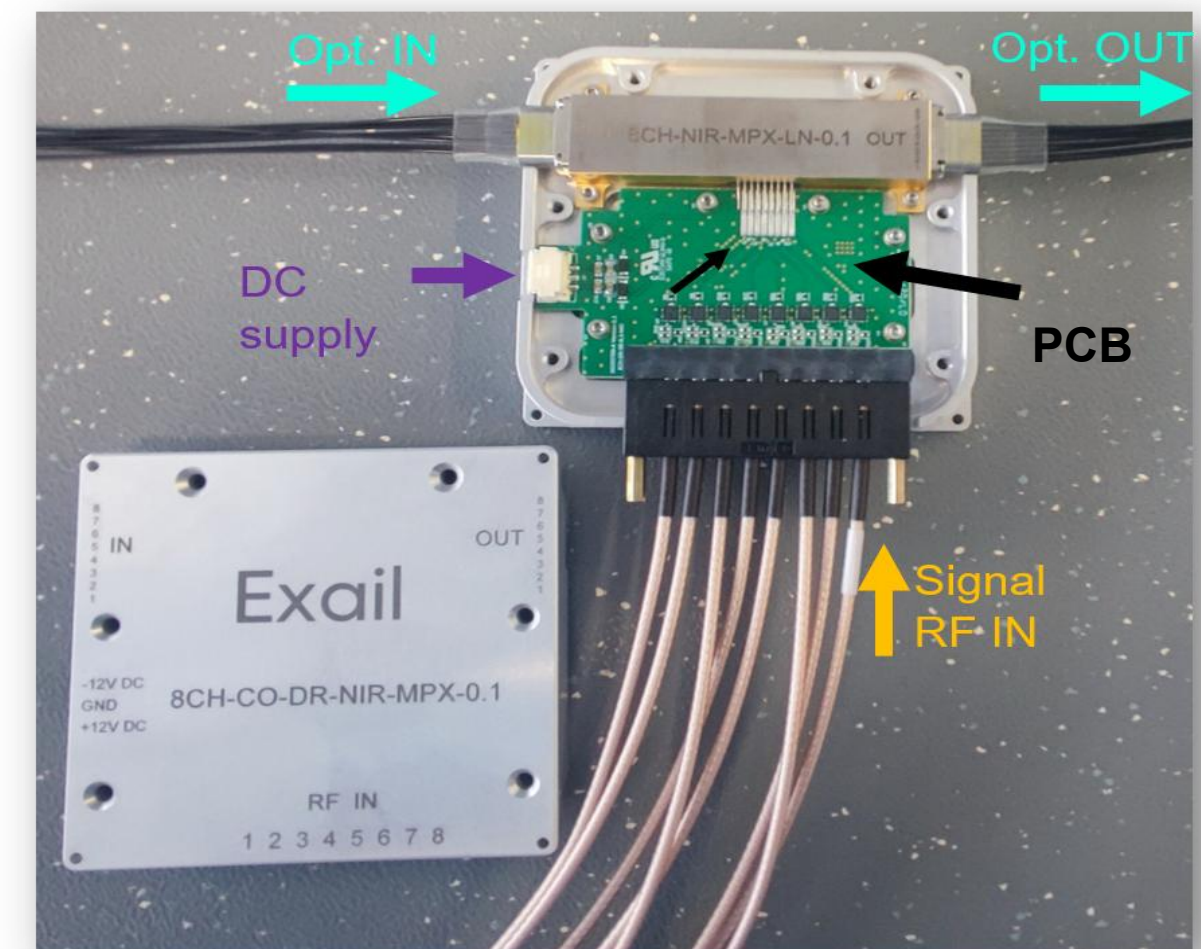
- Chip yield confirmed
- IL = [3; 6] dB without optical connectors
- $V_{\pi} = 4,7 \text{ V}$ and $\Delta V_{\pi} < 0.2 \text{ V}$.
- No inter-channel crosstalk (optical, RF, and phase modulation)
- Package dimensions L x W x H (approx.): 66 mm x 16 mm x 10 mm



➤ 8CH-CO-NIR-MPX-LN-0.1:

8-Channel Low-Frequency Phase Modulator & RF Driver Integrated Array

- 8-channel phase-modulator array
- PCB with 8-channel amplifier stages
- Compact package (80 x 80 x 20 mm)
- See updated datasheet for specifications



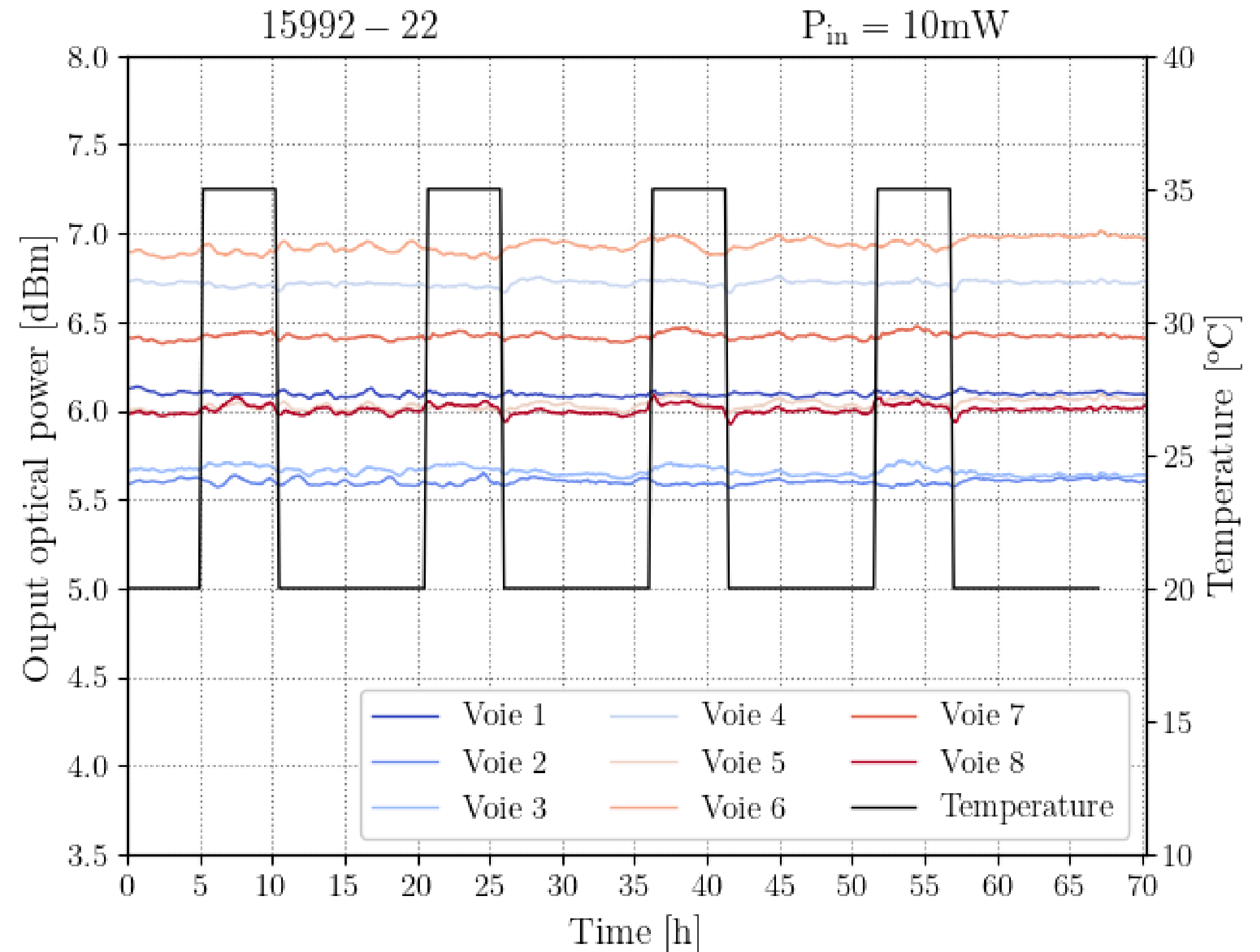
Environmental test: Thermal Cycling

➤ Test conditions:

- Input optical power/channel ~ 10 dBm
- Wavelength: 1064 nm
- Temperature variation: [+20°C; +35°C]

➤ Results:

- No degradation (V_{π} , S11)
- No optical degradation
 - Optical power variation < 2%
 - No change on PER





Exail – Leading European manufacturer of photonic components and systems for CBC & SBC Lasers Architecture

Wide-Bandwidth Electro-Optic Phase Modulators

for SBS Threshold Enhancement via Spectral Broadening

in CBC and SBC Lasers Architectures

Proven Electro-Optic Modulator Solutions for SBS Threshold Enhancement

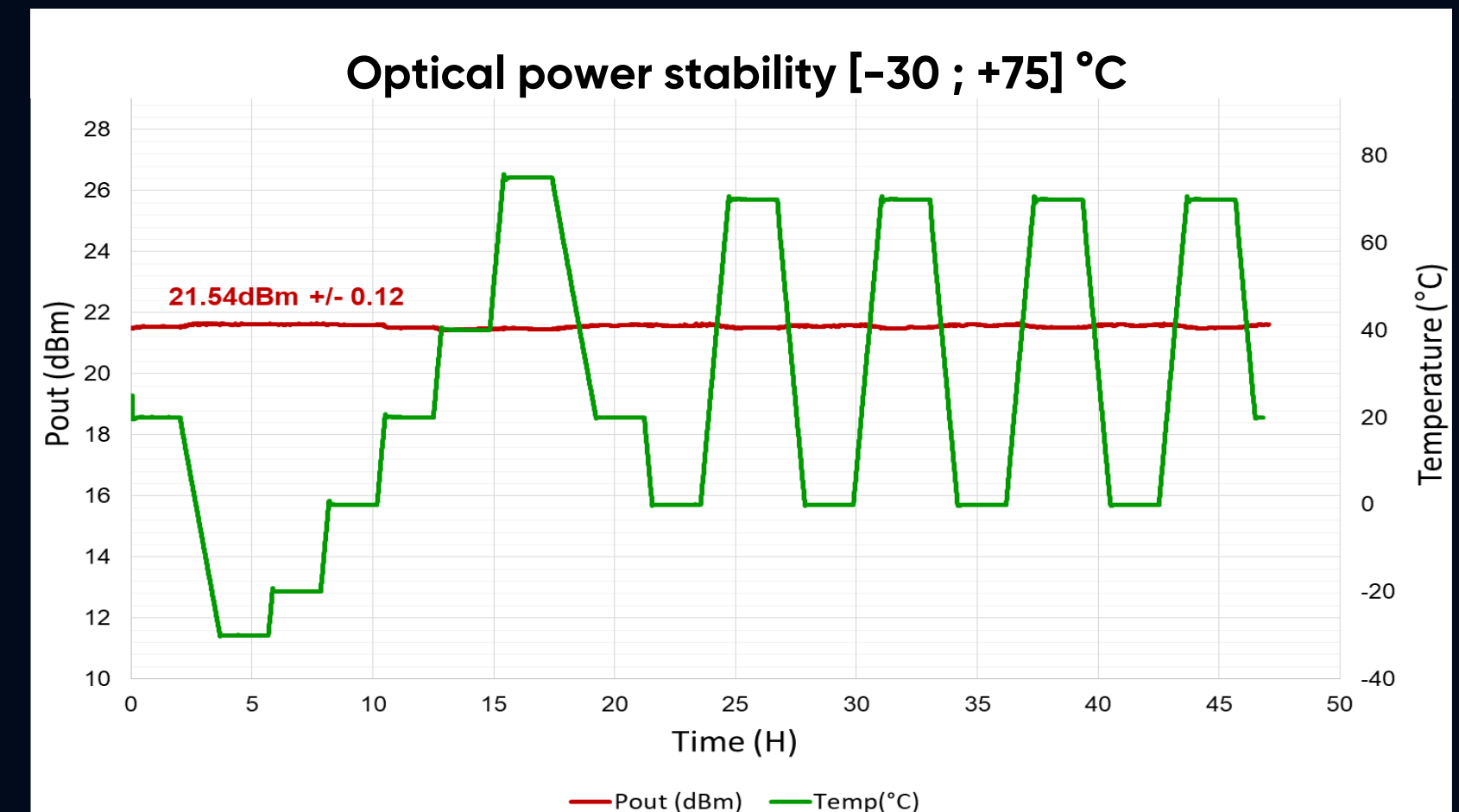
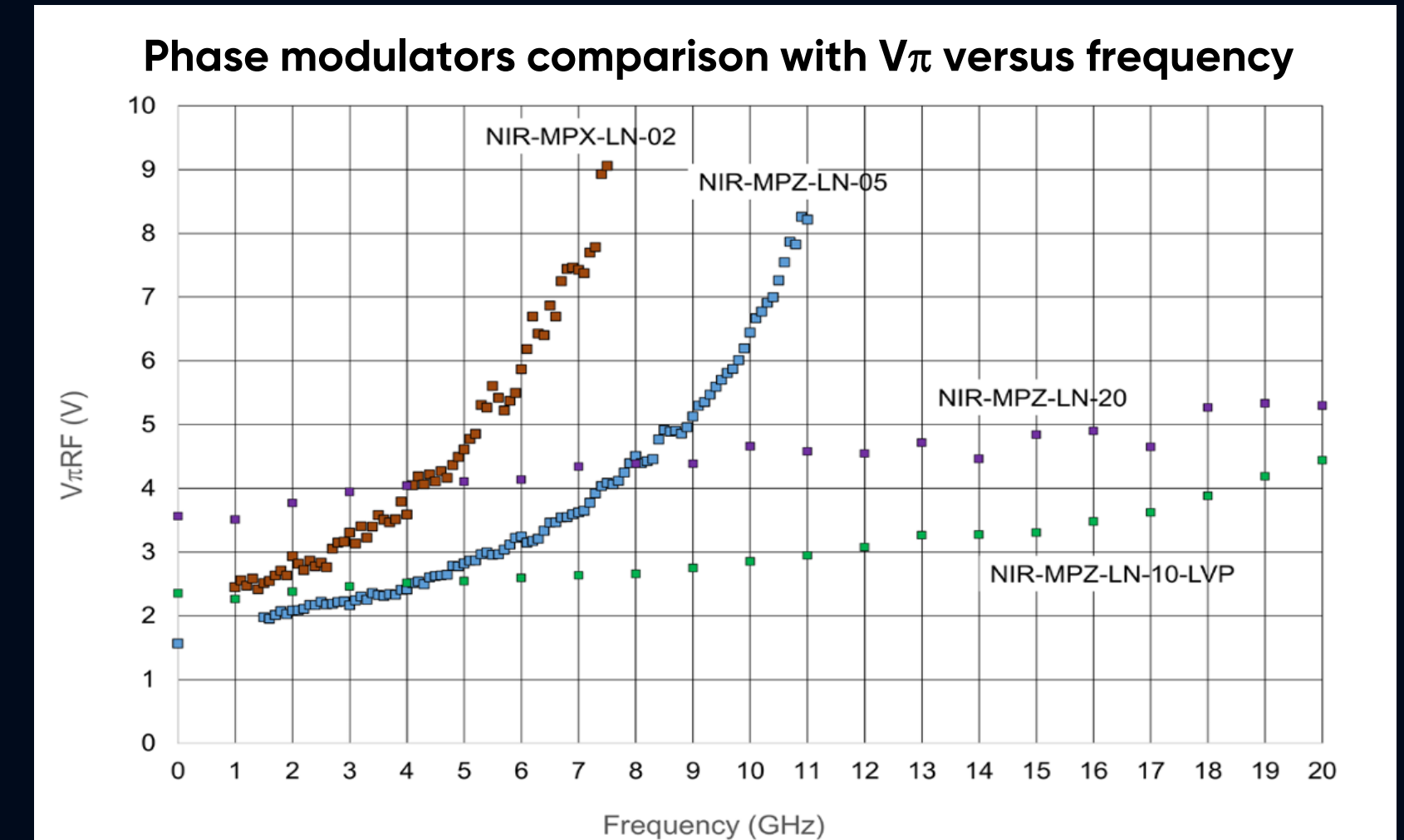
> Very low V_π and bandwidth modulators choice :

- The NIR-MPZ-LN-05-LVP features
 - V_π of only 1,5 V @ 50 kHz / 2 V @ 2 GHz / 3 V @ 5 GHz
 - Bandwidth @-3 dB 2 GHz/ Usable EO-Bandwidth up to 5 GHz
- The NIR-MPZ-LN-10-LVP features
 - V_π of 2,3 V @ 1 GHz / 3 V @ 10 GHz / 4 V @ 20 GHz
 - Bandwidth @-3 dB 12 GHz/ Usable EO-Bandwidth up to 20 GHz

> Incomparable optical waveguide and the key optical performances reached:

- Annealed Proton Exchange process on a selected LiNbO₃ doped wafer.
- High optical power handling capability of up to 500 mW
- Optical power stability < ± 0.5 dBm over [-30 ; +75] °C.
- Optical power stability < ± 0.15 dBm over [0 ; +70] °C
- High resistance to refractive index effect and Pyro-electric effect.

⇒ High optical performances stable over the temperature range and over the time



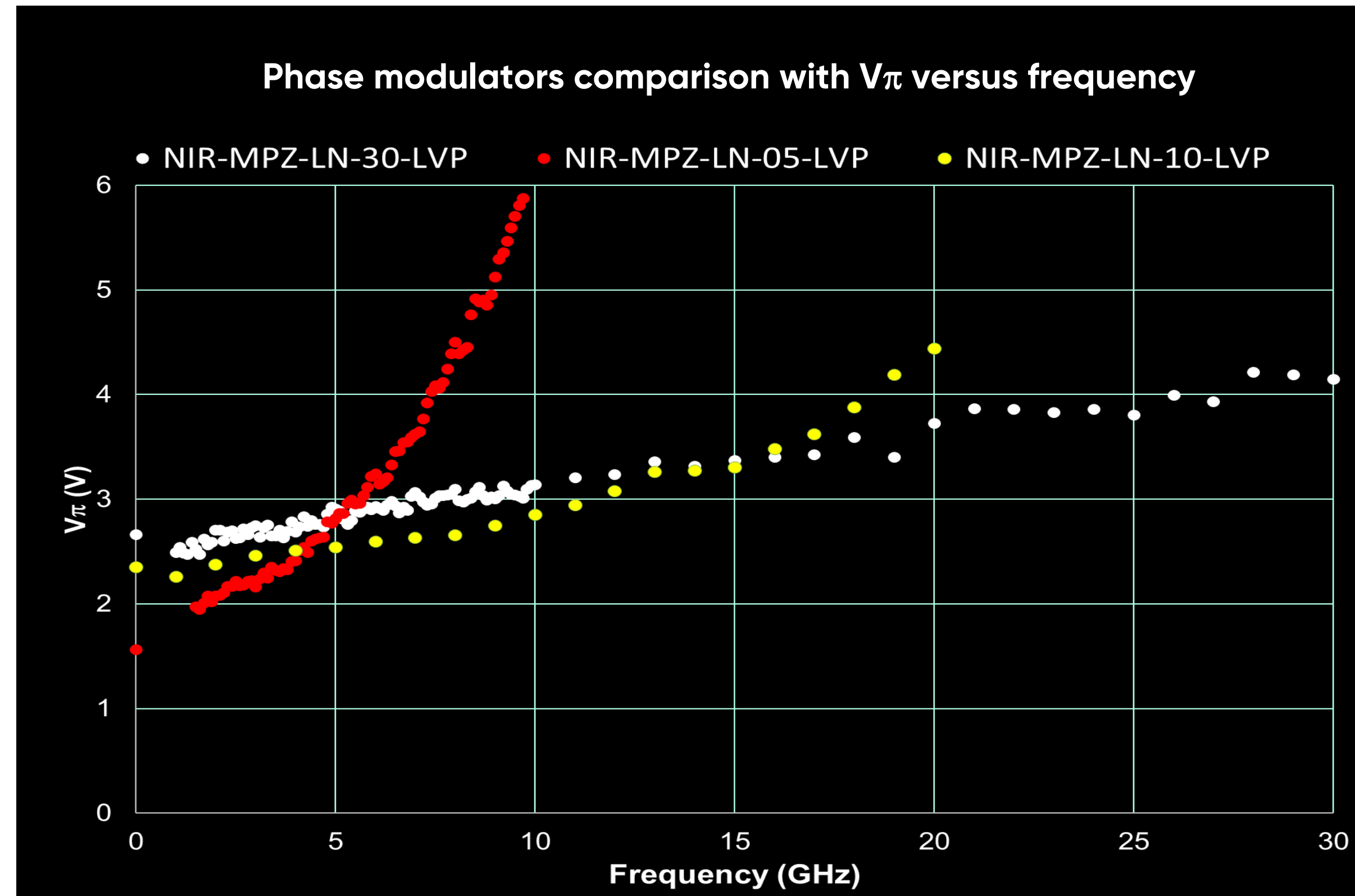
Industry-Leading Wide-Bandwidth EO Phase Modulators for SBS Mitigation & SBC

➤ New Very Wide Bandwidth NIR-MPZ-LN-30:

- V_{π} @ 50 kHz = 2.5 V
- V_{π} @ 10 GHz = 3 V
- V_{π} @ 20 GHz = 3.5 V
- **V_{π} @ 30 GHz = 4 V**
- $S_{11} < -10$ dB up to 30 GHz.

➤ A V_{π} -optimized modulator for:

- [0; 5] GHz: NIR-MPZ-LN-05-LVP for CBC
- [5; 16] GHz: NIR-MPZ-LN-10-LVP for CBC & SBC
- [16; 30] GHz: NIR-MPZ-LN-30-LVP for SBC





Exail – Leading European manufacturer **of** photonic components and systems **for** CBC & SBC Lasers Architecture

Laser Front-End Turnkey Solution

for Enhanced System Performance

in CBC Lasers Architectures

Exail is a leading provider of photonic systems for CBC lasers

ModBox-1064nm-Seed-SB

- Seeder source
- Spectrum Broadening
- 3U 19" unit

ModBox-Split

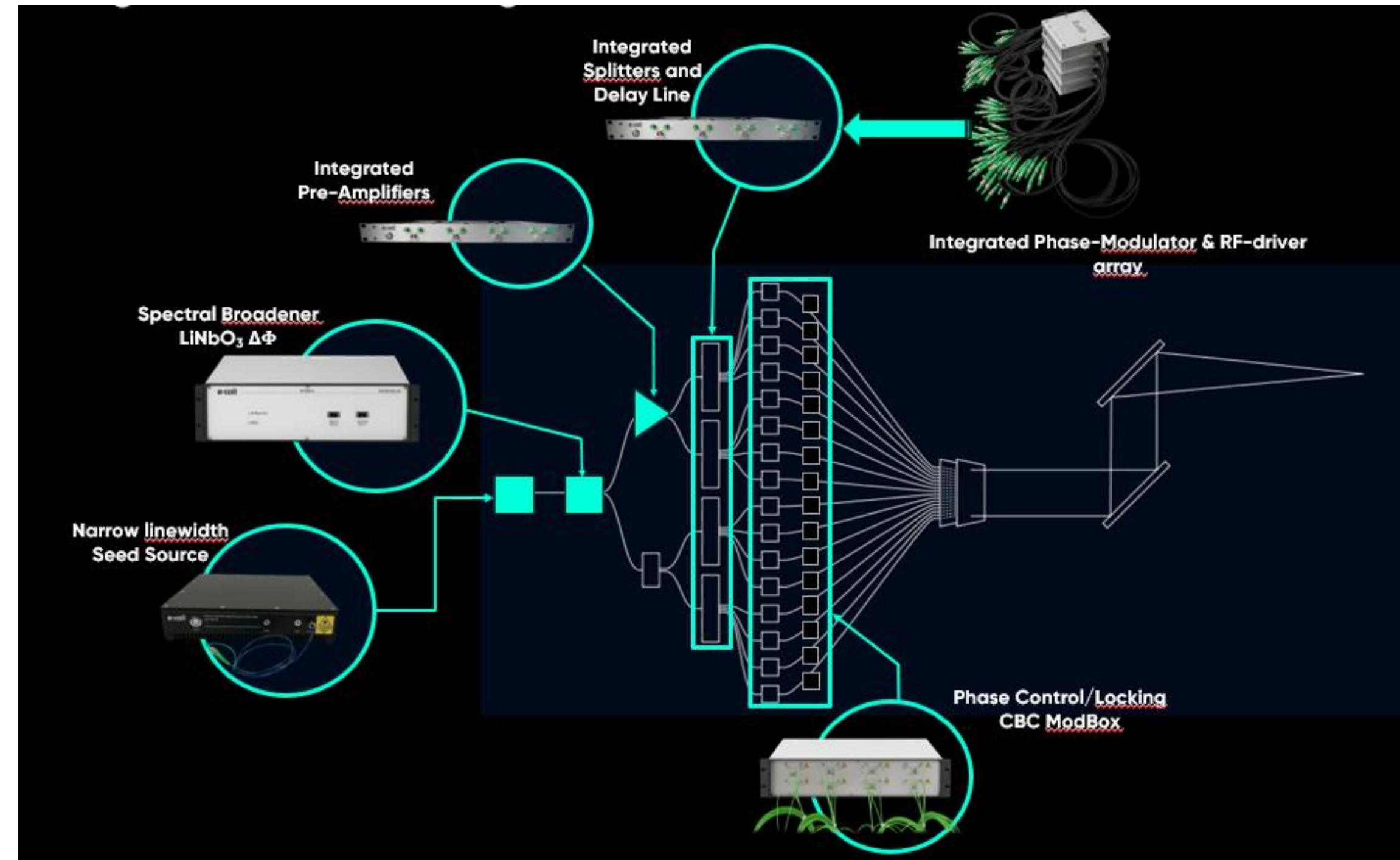
- Optical power Amplifier
- optical split
- 3U 19" unit

ModBox-1064nm-MP-24CH

- 24channels Phase control
- 2U 19" unit

ModBox-1064nm-8CH-VODL-POLC

- Seeder source
- 8x Variable Optical Delay lines up to 600 ps
- 8x Polarisation controllers
- 3U 19" unit



Optica Industry Summit on Defense and Aerospace

Dec.
8 & 9 ^{iXcampus}
(near Paris)
2026

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Thank you for your attention

Any questions?

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