



# Solutions for High-Power Beam Management

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# 01. ALITE in a Nutshell

Who we are



- SME based in Turin, the birthplace of Italian Photonics and heart of an industrial Photonics district.
- Funded in 2020 but with 50+ years of cumulative expertise of the founders.
- Strong synergies with Politecnico di Torino.



# 01. ALITE in a Nutshell

## Organization

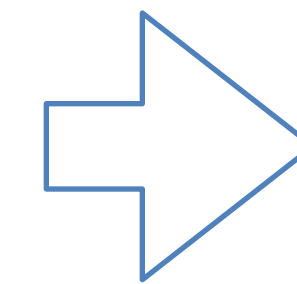
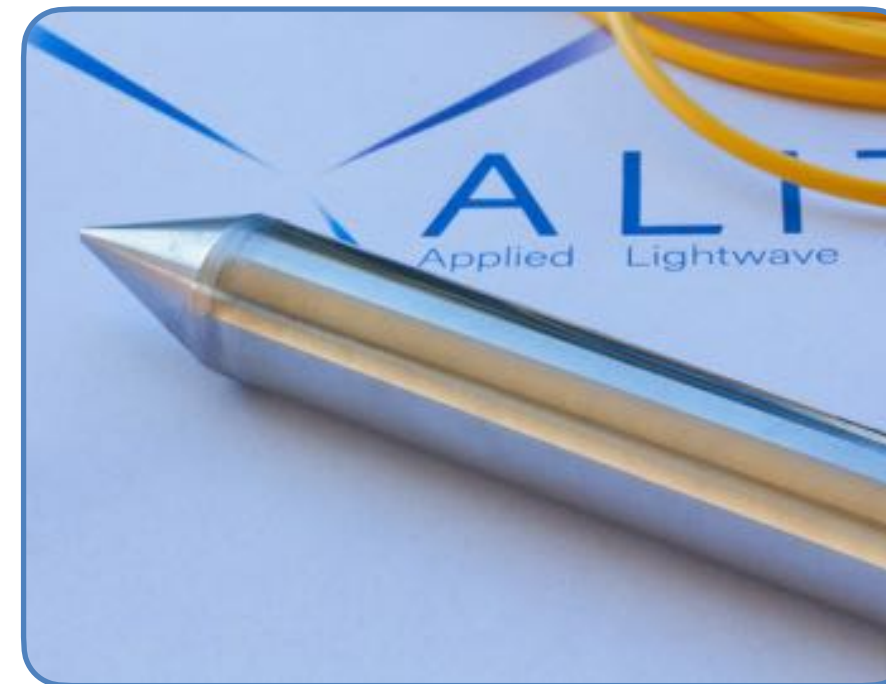
### LASER

- Custom laser sources.
- High-power beam combiners.



### SENSING

- Fiber monitoring systems (temperature, vibrations, water pollutants).



Personalization

## 02. ALITE Laser

— Custom solutions for laser materials processing

Tailor-made laser sources and beam management devices for environmental friendly processing of challenging materials (e.g., paper, cardboard, copper, gold, polymers)



# 03. ALITE Laser

Custom solutions for laser materials processing

**Tailor-made laser sources and beam management devices for environmental friendly processing of challenging materials (e.g., paper, cardboard, copper, gold, polymers) and direct marking on textiles, fruits, vegetables...**





# 04. ALITE Laser

Laser sources

- Customized NIR laser sources (e.g., wavelength stabilized for spectral multiplexing).
- Blue laser systems (e.g., modular source 50W-200W).
- “Non-conventional wavelength” lasers (e.g., 100W fiber laser @ 16xx nm).



# 05. ALITE Laser

Beam combining and switching

- kW NIR beam couplers and switches and spectral combiners.



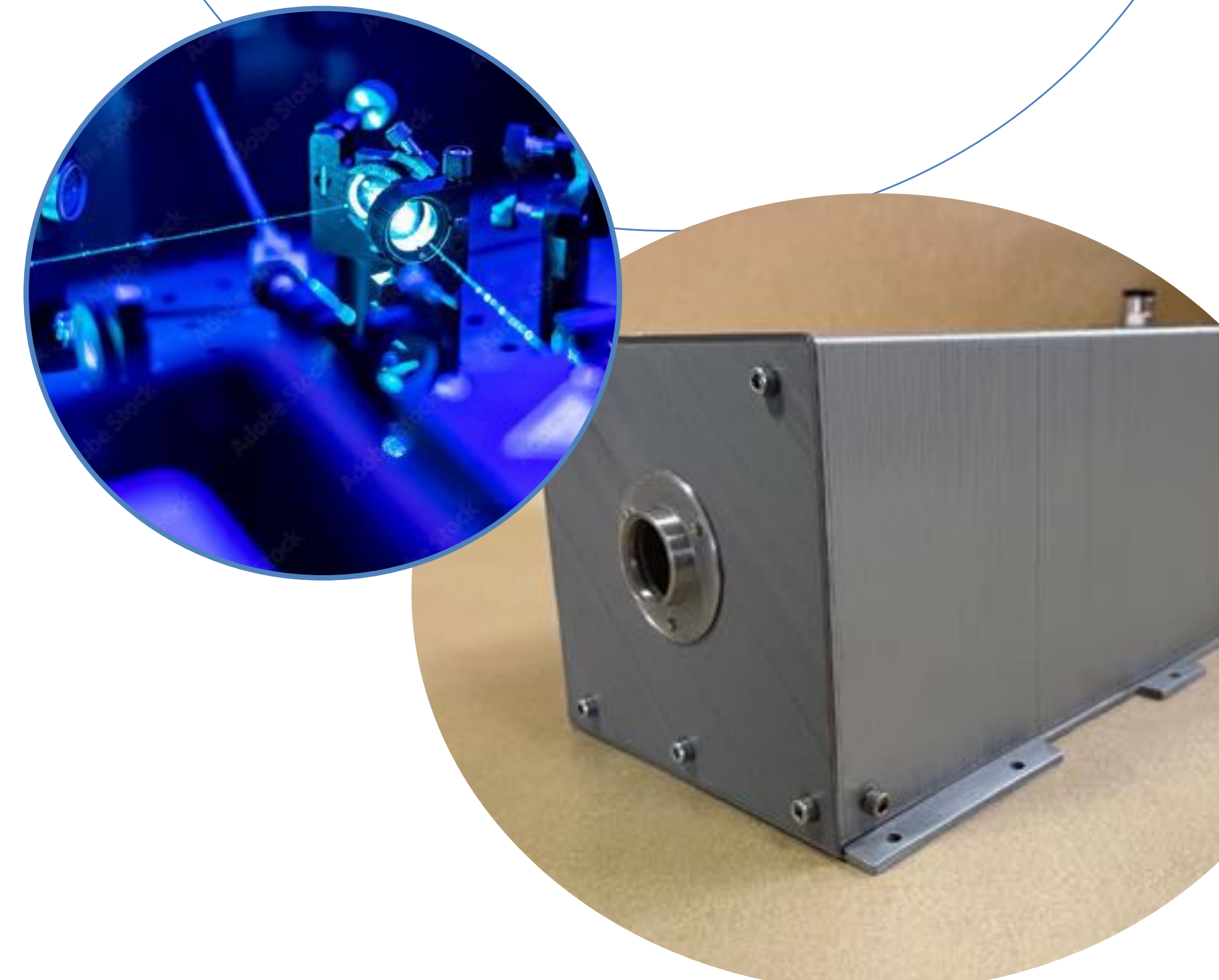
Max power/port	Up to 6kW	Up to 20kW
Ports/wavelengths	2	2-3
Connector	QBH or QD	QBH or QD
Input fiber diameters	50 $\mu\text{m}$ or 100 $\mu\text{m}$	50 $\mu\text{m}$ or 100 $\mu\text{m}$
Output fiber diameters	50 $\mu\text{m}$ to 1000 $\mu\text{m}$	50 $\mu\text{m}$ to 1000 $\mu\text{m}$
Cooling	Air	Water



# 06. COBALT Experiment

Part of PULSATE EU-project

- Project goal: develop a compact multi-material (→ **NIR or blue**) AM machine for artisan's workshops.
- Alite's role:
  - Develop a modular 50W - 200W blue laser source.
  - Develop the processing head.





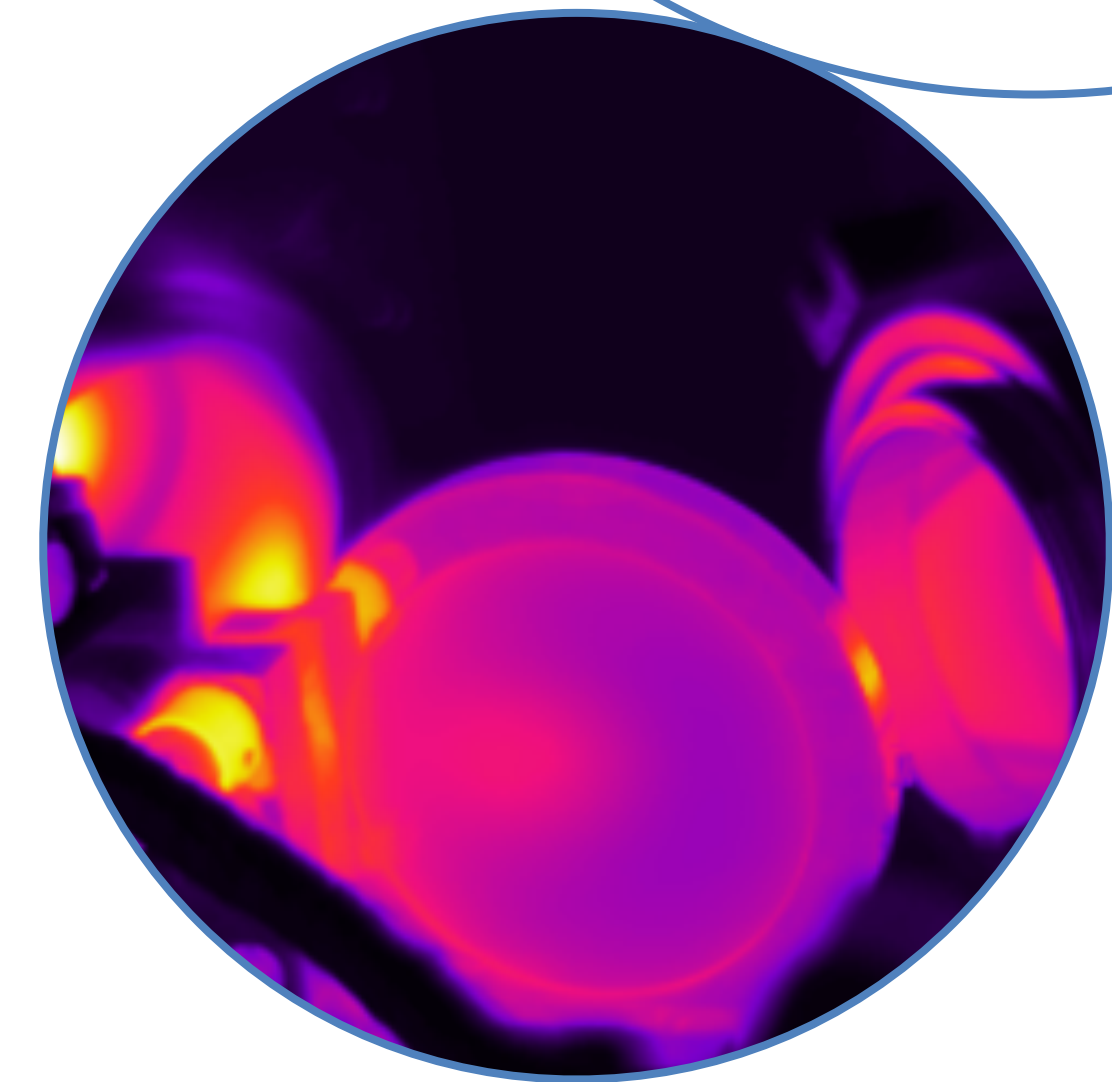
# 07. WISE Project

HE EU-project

- Project goal: develop an all-in-one machine that integrates 5 laser processes (→ **hybrid combiner**) for the direct fabrication of macroscale products with smart functionalities at the nanoscale level.
- Alite's role:
  - Develop the optical chain.



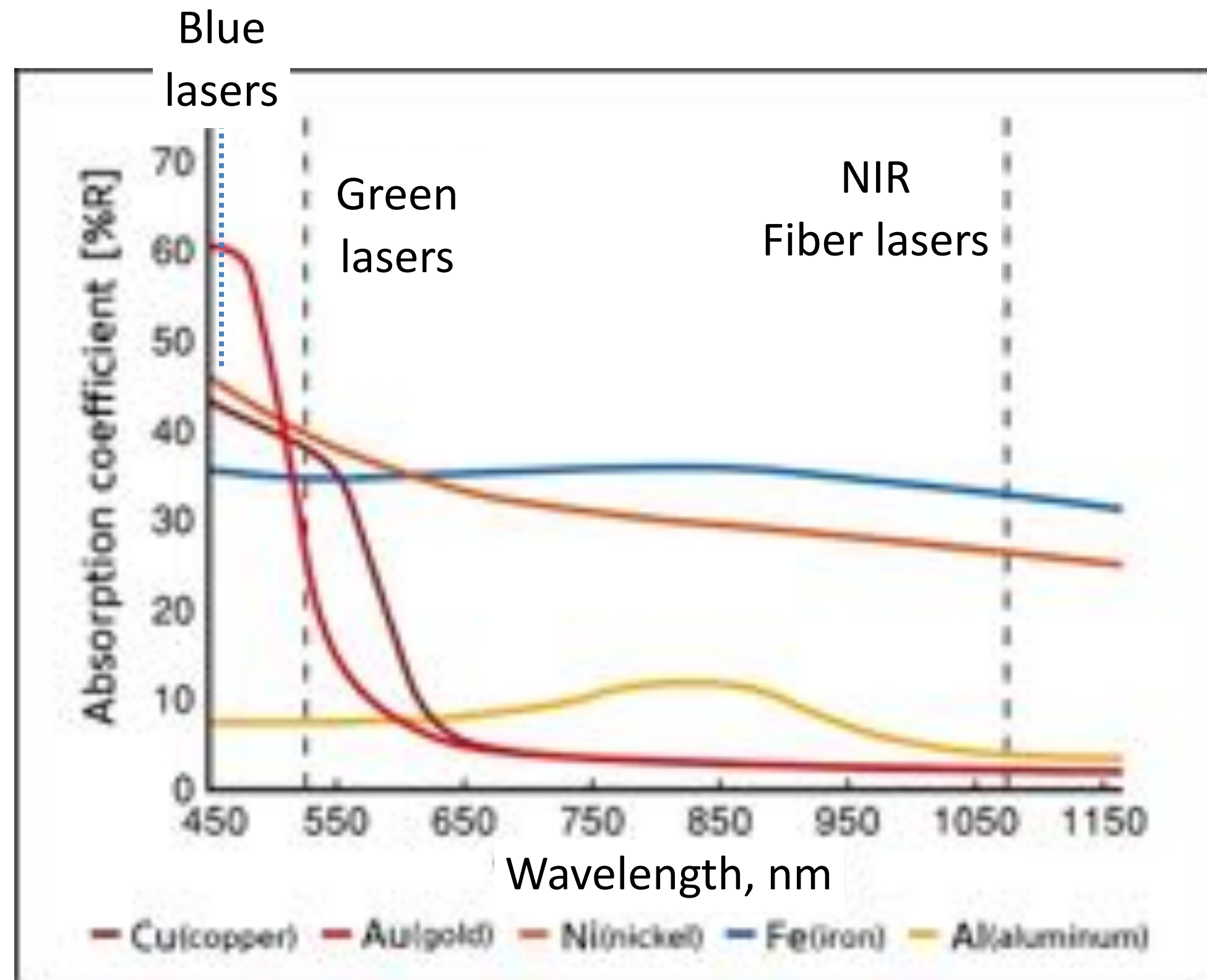
WISE



# 08. Exploitable Outcomes for Welding

New technologies

- Hybrid VIS-NIR processing head.



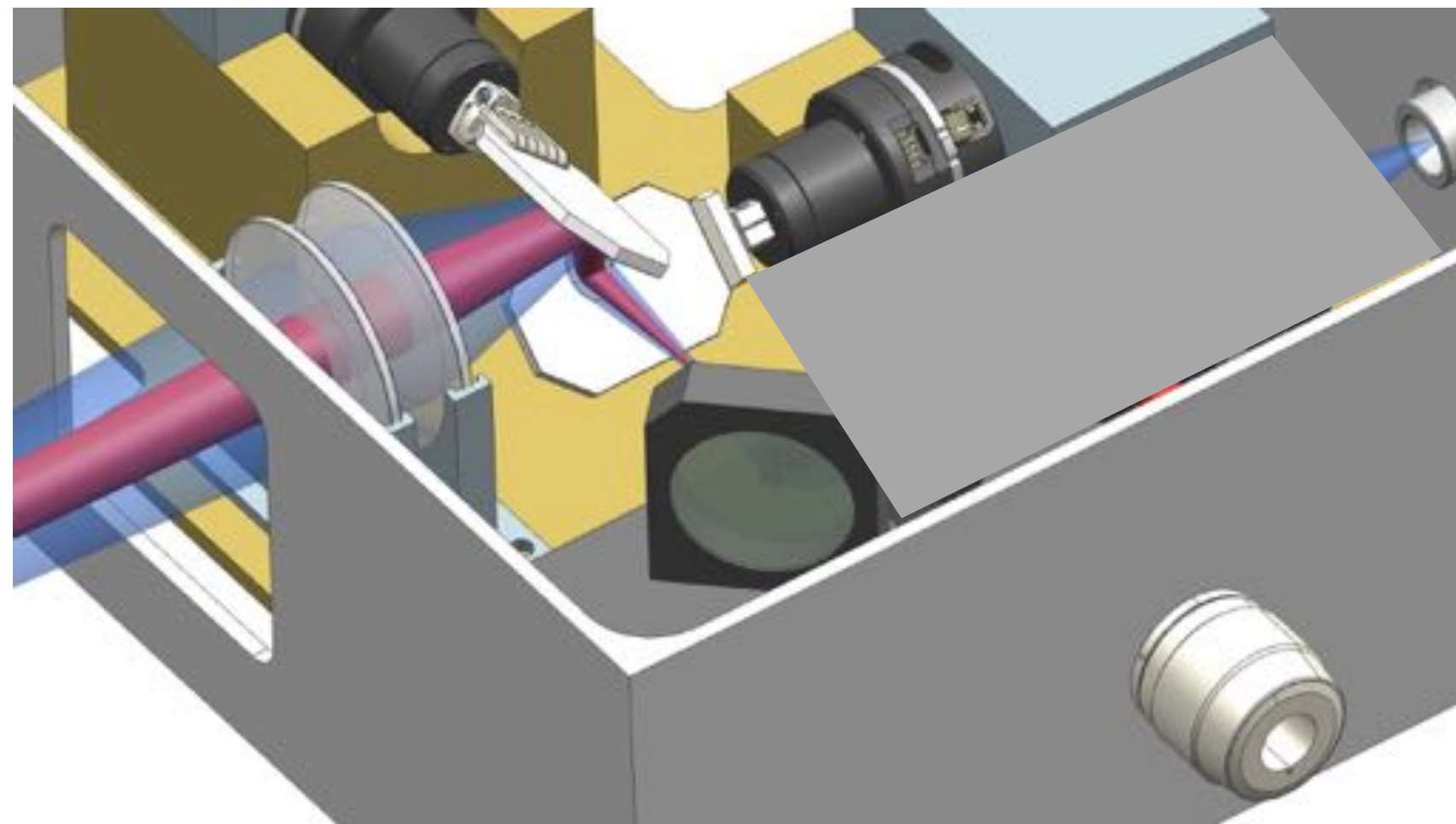
- Very far apart wavelengths.
- Very different beam quality.



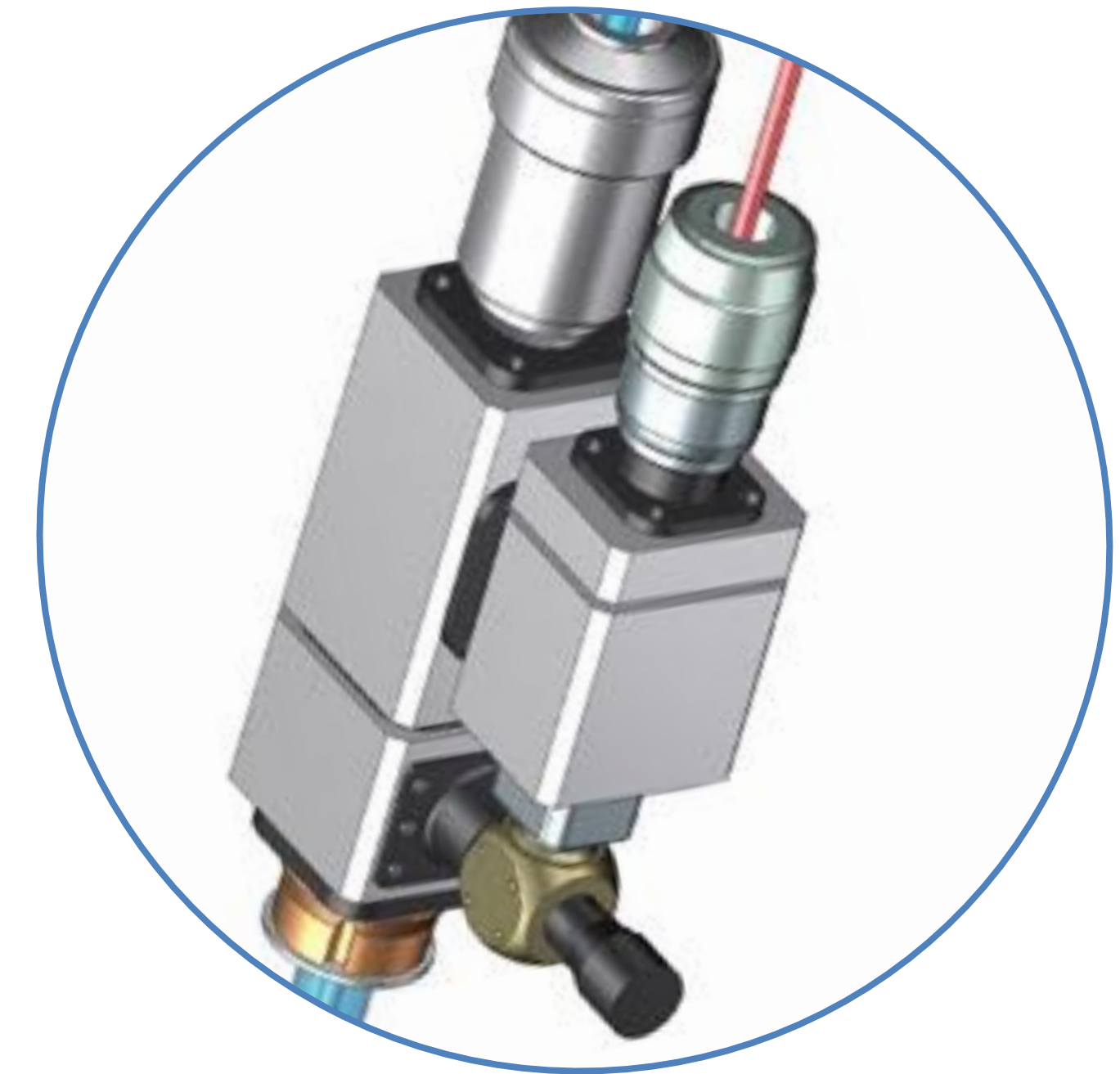
# 09. Exploitable Outcomes for Welding

New technologies

- Hybrid VIS-NIR processing head.



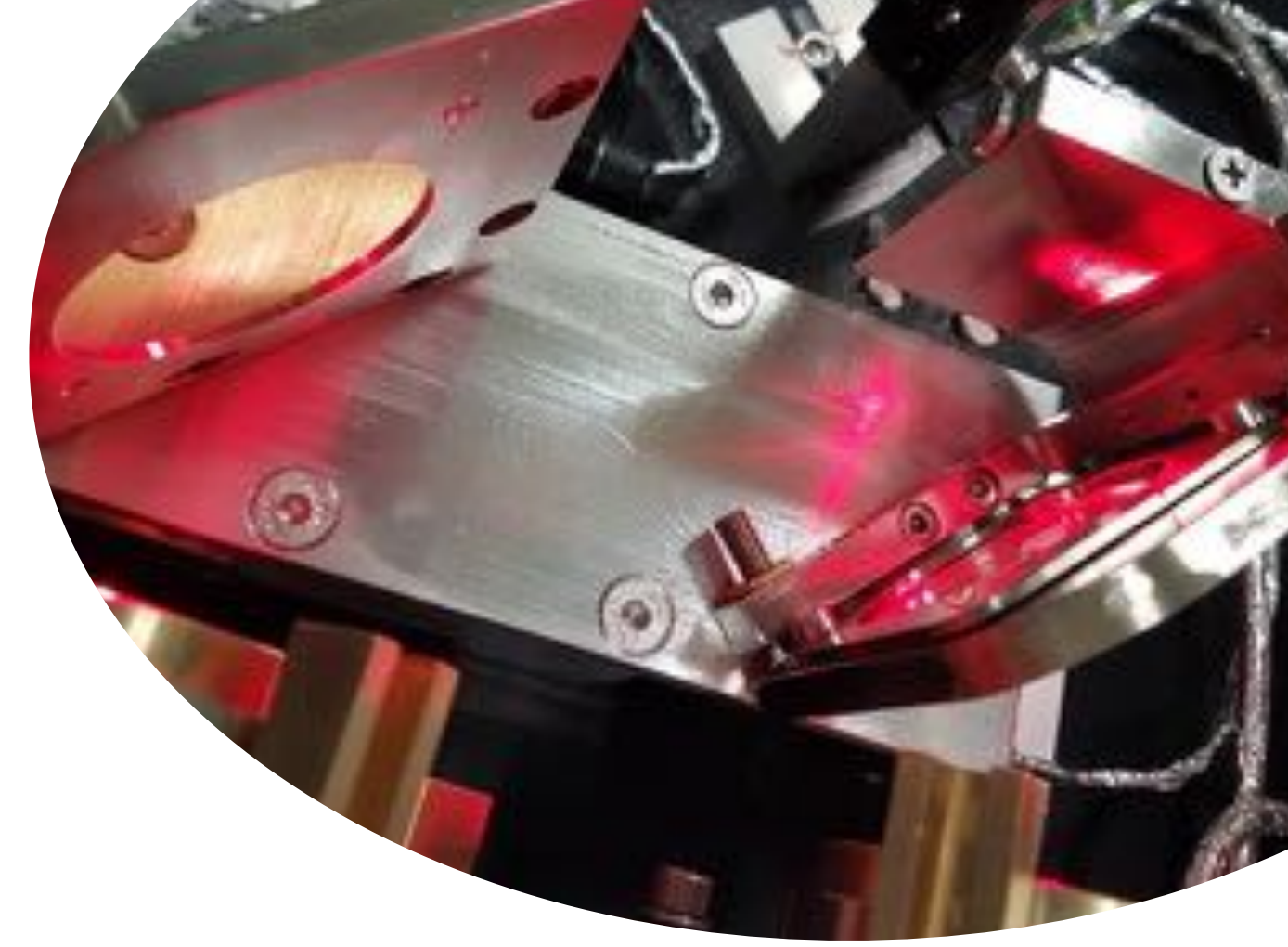
Patent pending hybrid scan head



# 10. Exploitable Outcomes for Welding

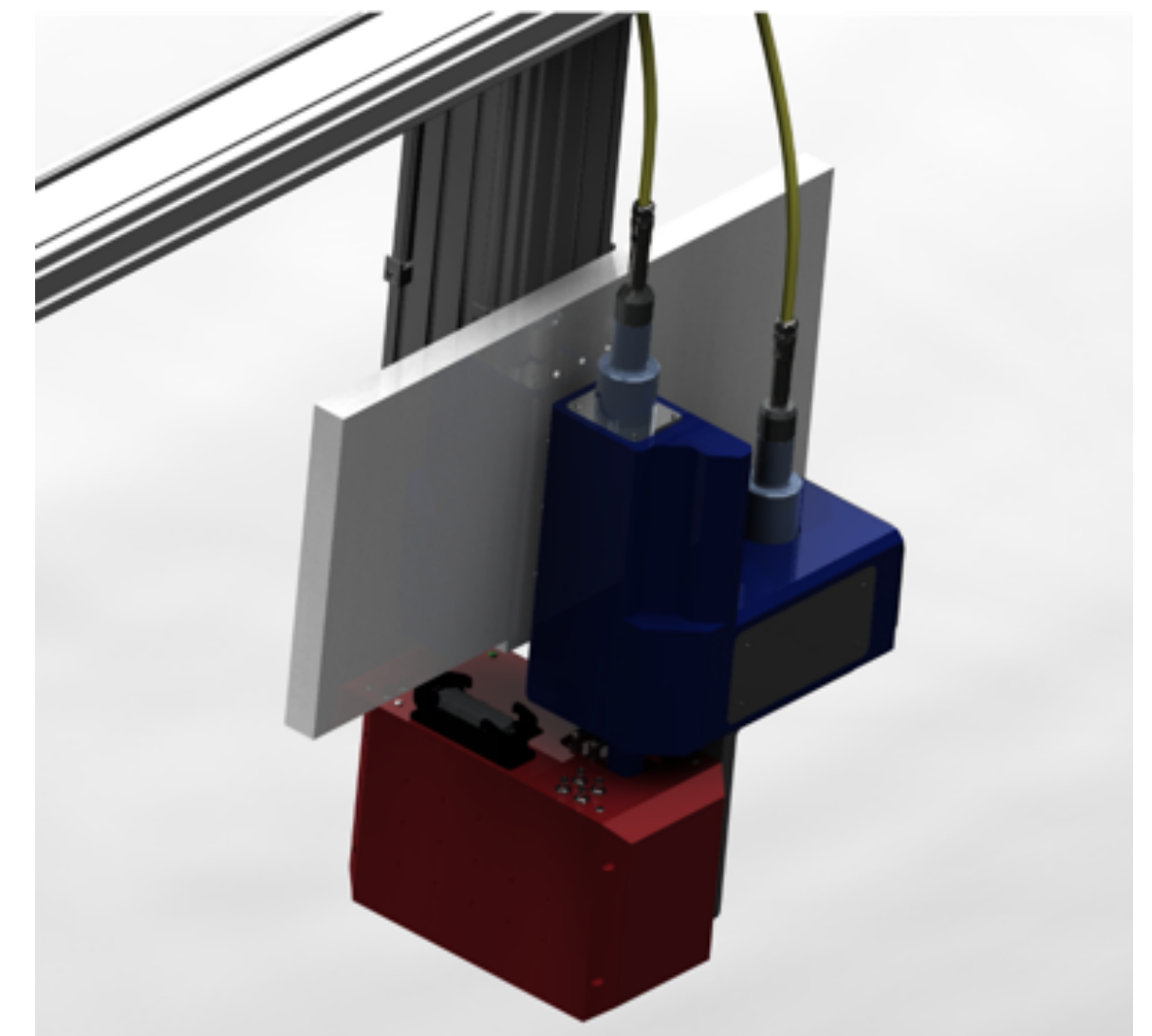
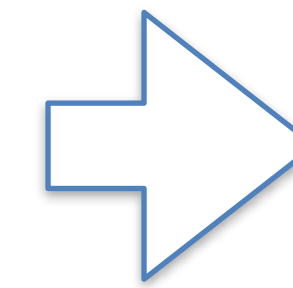
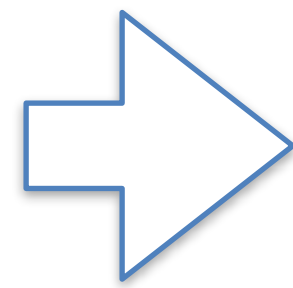
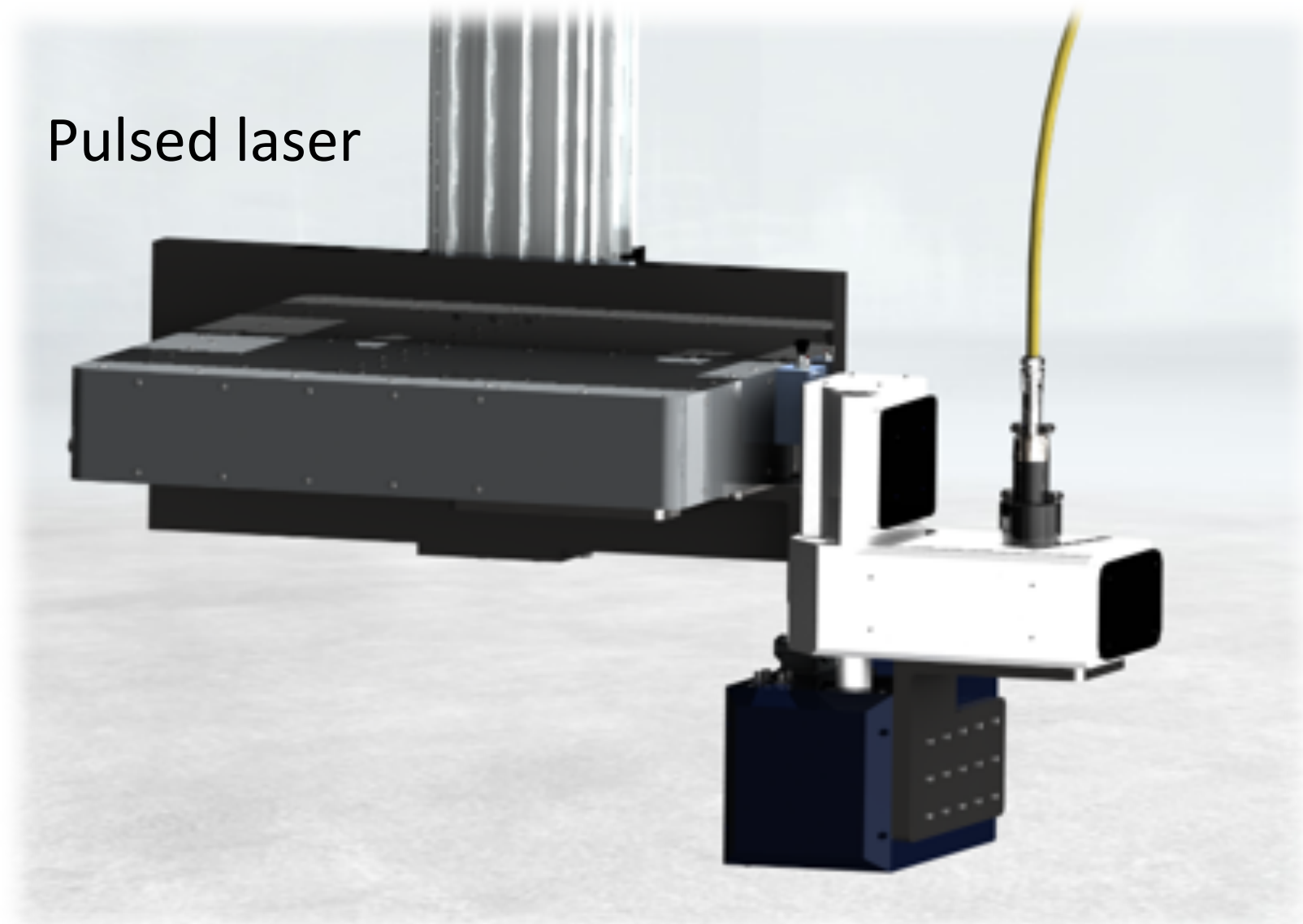
New technologies

- CW + pulsed laser combination.



VIS-NIR CW laser

Pulsed laser





Thanks for your attention



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