



Industry role in Eupraxia

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Some historical perspective....(solid-state lasers only)

Large scale Laser-based research infrastructures have been built for Inertial Fusion Energy programs

- By National Labs (LLNL, LLE, CEA, ...)
- Using Nd Glass Lasers (large aperture slab for high energy (> kJ) per single channel and combination of multiple channels for current lasers: NIF, LMJ, OMEGA)
- Have led to huge infrastructures (NIF = 4 football fields / mostly occupied by laser itself)
- These infrastructure have allowed a lot a resarch in High Energy Density (HED) field

Advent of CPA as concept & Ti:Sa as active material have produced a disruption

- Shorter pulses & lower energy
- **Smaller lasers**
- **New physics : Ultra High Intensity (UHI) → Particle acceleration & secondary sources**

Some historical perspective....(solid-state lasers only)

Emergence of industry for TiSa CPA

- As soon as early 90s (1st 1 TW from Thales for KEK in 1995)
- Capability to deliver full systems (affordable cost and risks)
- First collaborations with academia in late 90s
- Academic labs doing laser development well ahead industry for innovation & performance

“Acceleration” in the past decade

- First PetaWatt granted to industry : BELLA @ Berkeley (2009)
- Academia and Industry innovating jointly (joint PhDs, common projects, joint labs)
- Major role of laser companies in ELI, providing most of the laser systems as a full solution users-oriented

A personal feedback on current Eupraxia CDR phase

- General feeling : “industry-friendly” project
- Industry welcome to participate to the meetings
- Significant involvement of industry in the SAC
- Discussions are open and consider possible involvement of industry for the next phases

What's next

- **Industry seems ready to continue to be involved**
- **For laser requirements, a good balance has to be found between scientific & technical ambition for performance and securing the future operation of Eupraxia machines (reliability of selected technologies, costs of operation & maintenance)**
 - Permanent interaction between Eupraxia academic partners & industry representatives will be welcome and key to succeed in ambitious while achievable laser requirements
- **It would make sense to associate industry to R&D programs for risk mitigation as early as possible and to find the relevant funding mechanisms**
- **Building the full Laser systems for the 2 Eupraxia machines seems feasible for industry considering past & current projects (ELI lasers on good way)**
- **Industry could also provide services for operation period**
- **Whatever the schemes selected it is essential that academia & industry are together finding ways to cooperate and to avoid any kind of competition.**

What's next

- Suggestion is to organize a dedicated workshop between Eupraxia & industry regarding next phases
- What about industry for acceleration & FEL parts ? (not my domain but looks like no one in industry is yet capable to play a role as architect & integrator of the solution)