



French-German Defence Research Institute: Lessons learned for EU defence research

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ISL, a joint initiative of:



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R&T : empowering EU's technological edge in a context of evolving threats



Improvised Explosive Device
(volume = grapefruit;
moving roof = 20.000 kg
ISL bunker test)



T-14 ARMATA Main Battle Tank
Threat Reference specified by France & Germany
for ISL-driven Scientific/Operational Study
on a future Main Ground Combat System (MGCS)

ISL = “Frontline Research”

- **Protecting** the war fighters and first responders on the battlefield by:
 - **Detecting** adverse weapons
 - **Mitigating** the effects of adverse weapons
 - **Protecting** soldiers & vehicles from the residual effects of adverse weapons
- Delivering **perturbation or destruction energy** onto the targets:
 - In a precise manner (avoiding collateral damages)
 - At long range (protecting own soldiers)
- At an **affordable** cost
- Priorities set by the **2 largest Defence S&T budgets** in continental Europe



Studying chest trauma
(conveyed by a body armour
hit by a projectile) - ISL



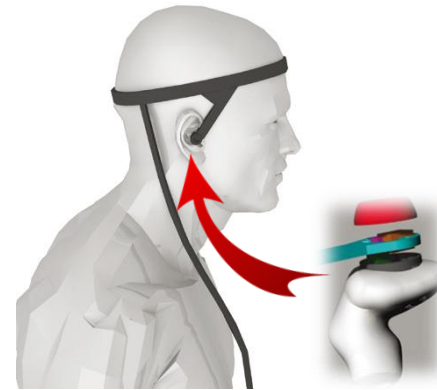
Shot of an Electromagnetic Railgun
(faster and stronger to the target)
ISL

Support Defence-specific research in the long run

- Defence technologies more *specific* than maybe expected
e.g. noise reduction systems



Commercial noise reduction
headset for airliners
(countering constant moderate
engine noise)



ISL's multi-function active acoustic protection
against arms-generated blast
(> 150 dB; $0,0001$ second)

Fruit of 20 years of specific research

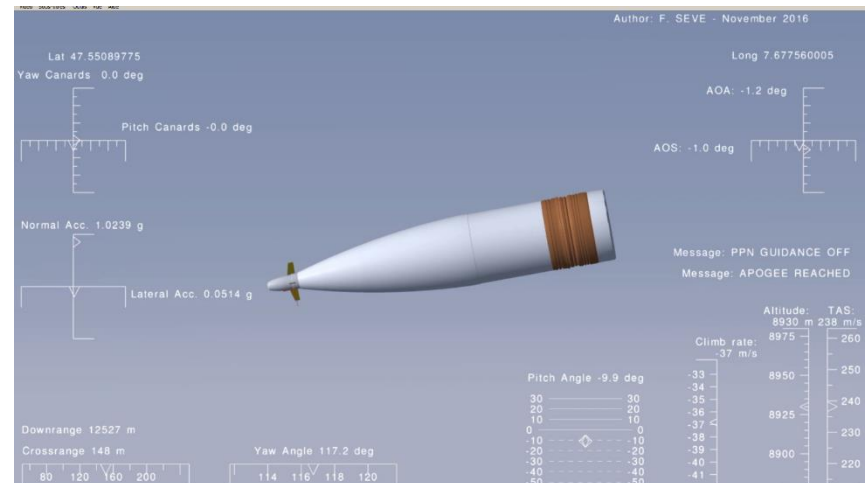
⇒ *Perseverance* in supporting Defence technologies and competences is key
supporting instruments to be adapted to each phase of research (incl. "EU-DARPA"?);
a funding *flow* is essential; projects-based funding alone not enough.

Nothing replaces co-localization of scientists

- **Leverage cultural differences**
scientific, technical, management cultures
- **Leverage inter-disciplinarity between next-door scientists**
breakthrough innovations often occur at interfaces between disciplines

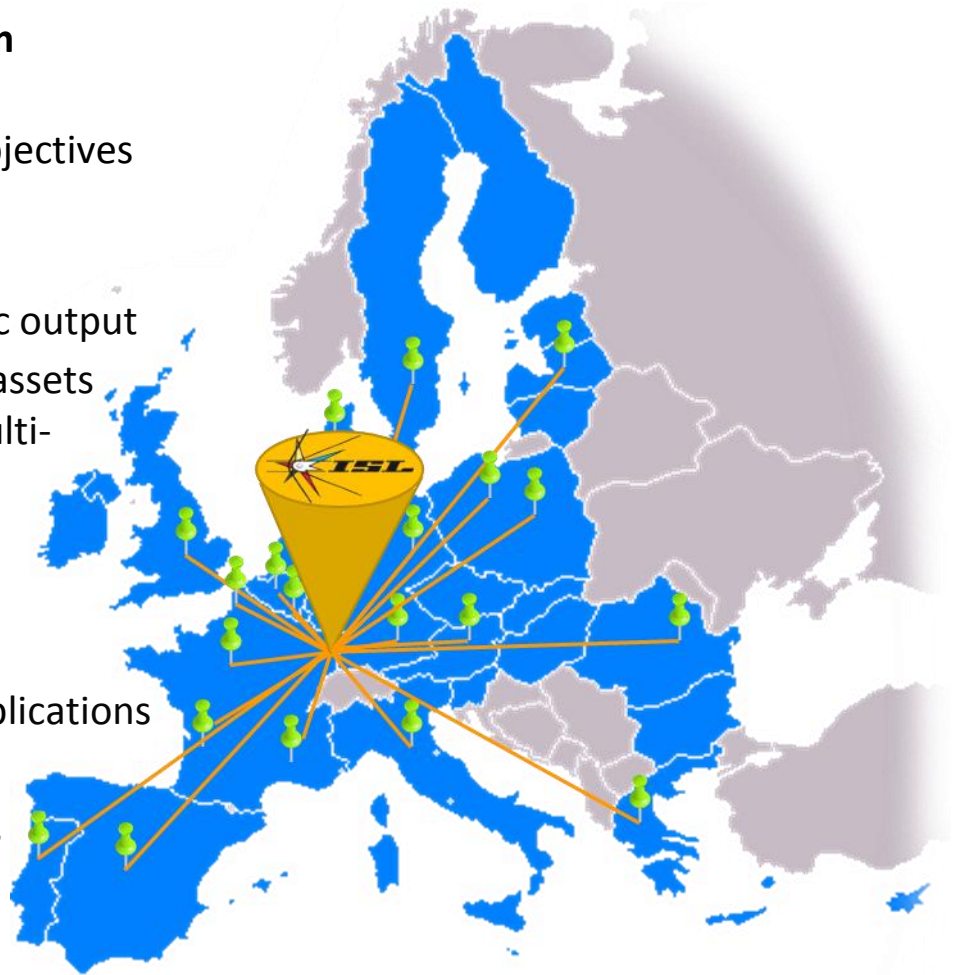
⇒ **Support co-localisation** of scientists from different disciplines and Member States

Designing low-cost, accurate,
long-range guided projectiles :
*aerodynamics, control science,
pyrotechnics, ballistics, materials sciences,
radio-communication sciences,
hardening know-how (ISL)*



Build on disseminated academic knowledge

- **Shared PhD students *catalyse* long-term scientific partnerships**
academic labs contribute to ILS's R&T objectives
 - ***Win-win* situation**
for ISL: multiplier effect on ISL's scientific output
for the partners : access to ISL's unique assets (unique facilities, inter-disciplinarity, multi-nationality);
these competences are then leveraged at home
for the EU : increase the level of competencies, without unnecessary duplications
- ⇒ ***Foster*** this towards students / post-docs with a ***DEFENCE-ERASMUS*** programme?





**French-German Defence
Research Institute
*Frontline Research***

In a nutshell, 3 suggestions:

- ⇒ ***A sustained, perseverant support*** to Defence technologies and competences is key
- ⇒ ***Support co-localised Centres of Excellence*** for scientists from different disciplines and MS
- ⇒ ***Foster exchanges of scientists*** to and from these Centres of Excellence (DEFENCE-ERASMUS?)

Thank you for you attention