

first light

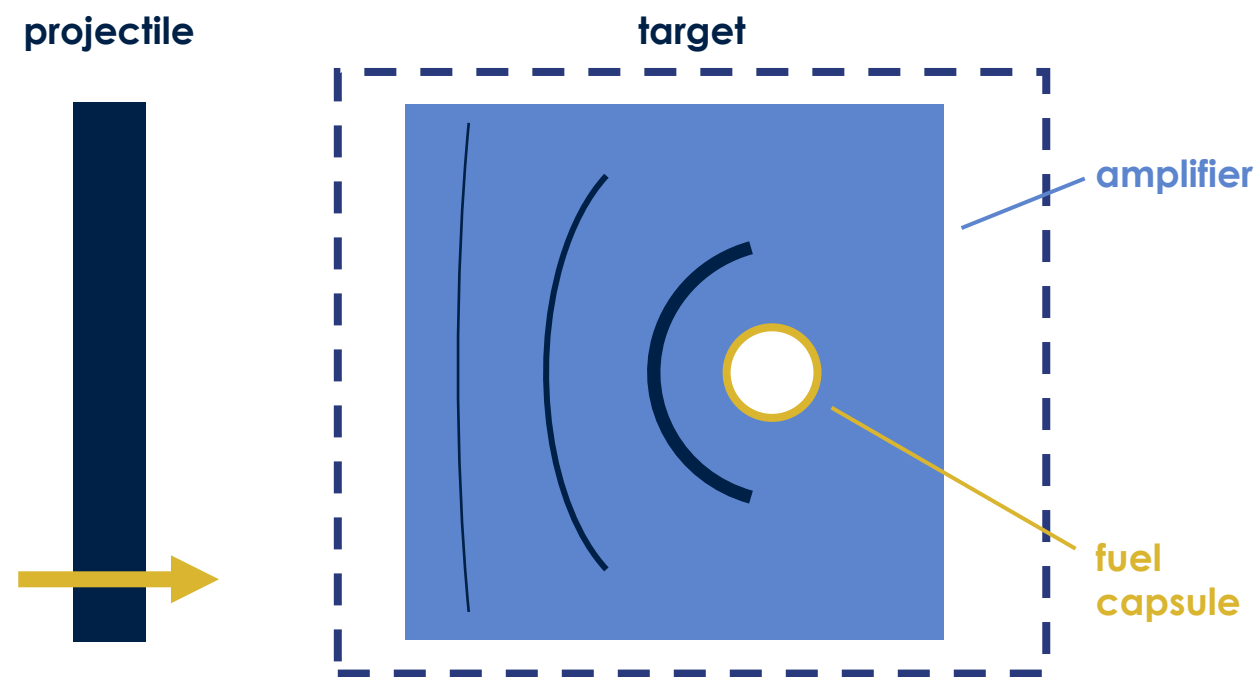
A one-sided approach
to inertial fusion

12th Sept 2023

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Our proprietary amplifiers are the key to making one-sided inertial fusion work

- Amplifiers boost the velocity and create spherical shaping, recreating identically robust literature designs
- The behaviour is complex, but the physics is simple → fluid dynamics
- Simulation tools are the key enabler, allowing iteration in weeks not years
- Faster progress on triple product than any other fusion technology in history



**We have proven this works, showing fusion for the first time,
validated by UK Atomic Energy Authority**

Machine 4

Sandia, Z-machine → 6 MV



Launch

Sandia, Z-machine → 45 km/s

FLF, M3 → 20 km/s

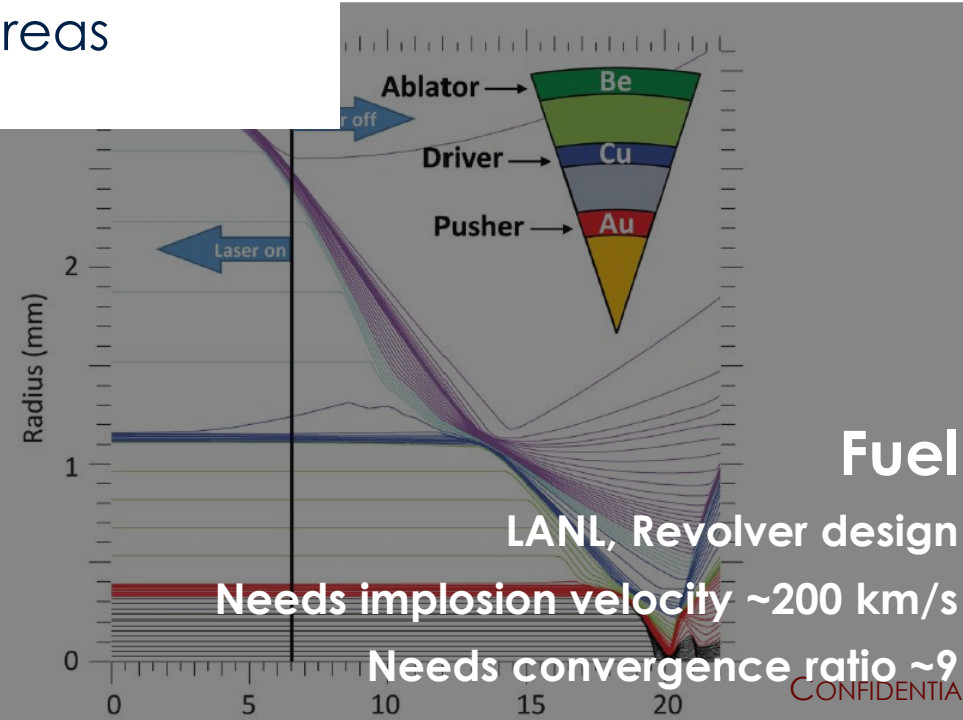
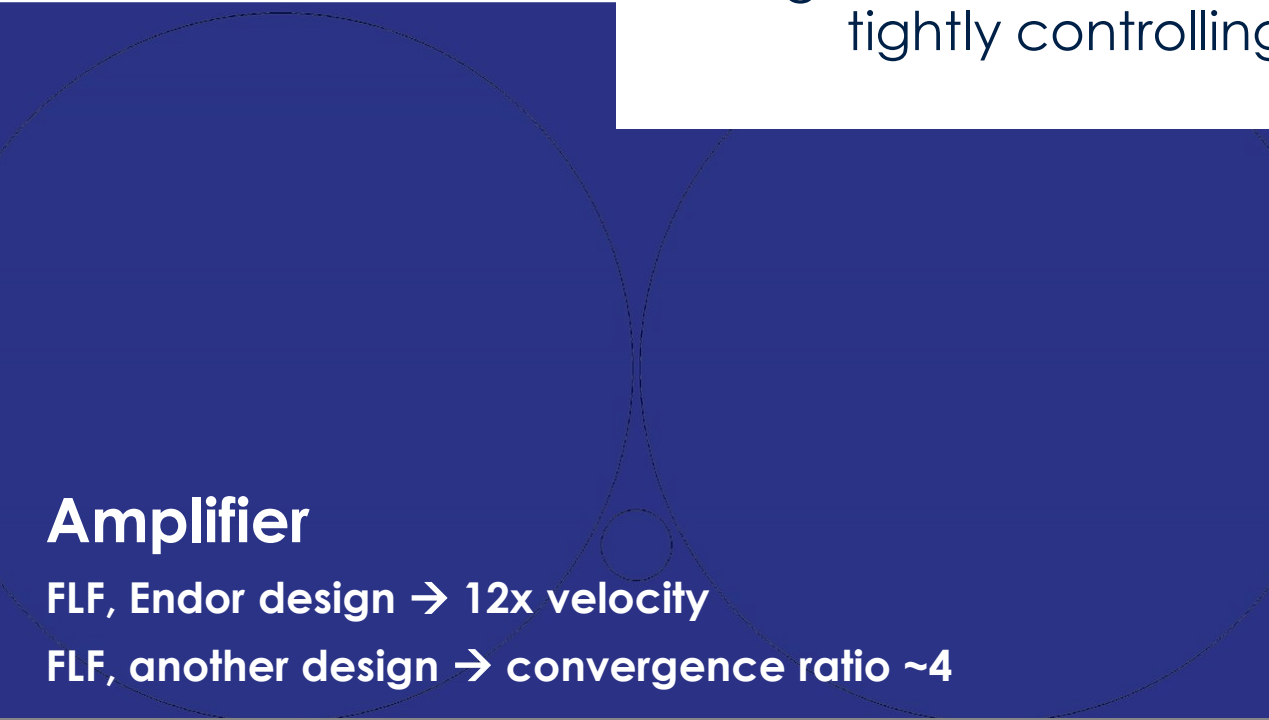


The gain demonstrator has four parts, we are tightly controlling risk in all areas

Amplifier

FLF, Endor design → 12x velocity

FLF, another design → convergence ratio ~4



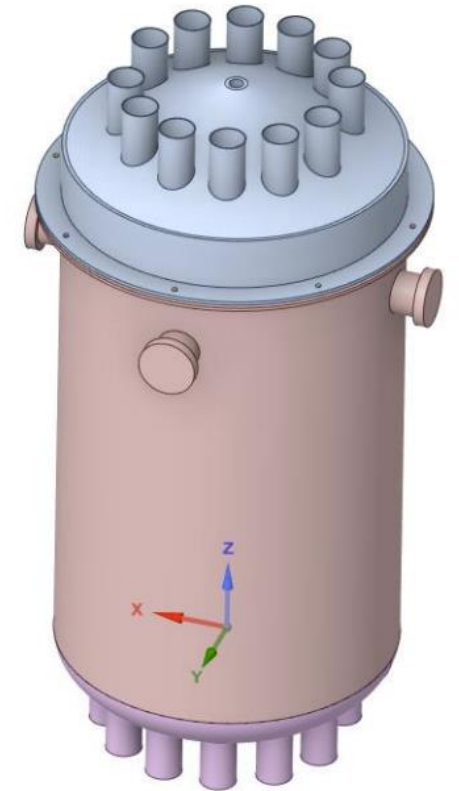
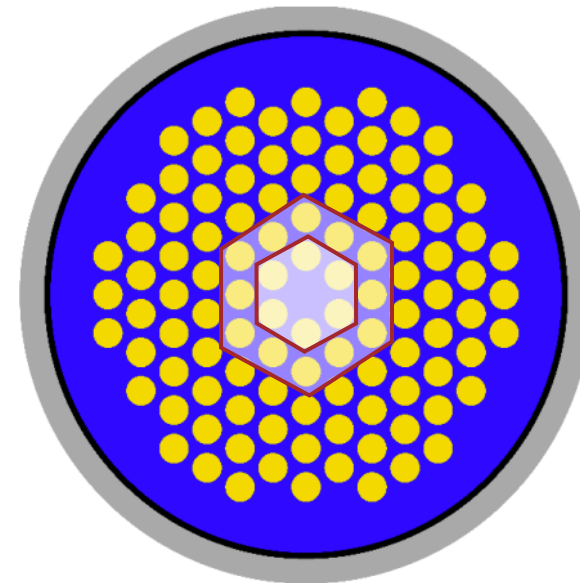
Liquid design simply sidesteps the three major engineering challenges

- Liquid first wall design avoids known fusion engineering challenges
- Reuses existing engineering from nuclear reactors, specifically fast breeders
- Balance of plant built with existing TRL9 technology
- Pure unenriched lithium
 - TBR > 1.5
 - Vessel lifetime > 40 years



We have found that a flexible reaction chamber design is achievable

- We have been working with IDOM on the design of the reaction chamber
- The jets of lithium are arranged on a hexagonal grid – they are close packed circles
- The latest design uses 12 rings of jets and is designed for powers from 60 – 400 MW
- The compromises are:
 - a higher pumping power than optimal for 60 MW (~2% of total output)
 - a large vessel (7 m diameter)





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Thank you for your attention
Please get in touch

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