WP 11.2
“High-Efficiency Klystron Industrial Prototype”

I.FAST P1 review

09/02/2023

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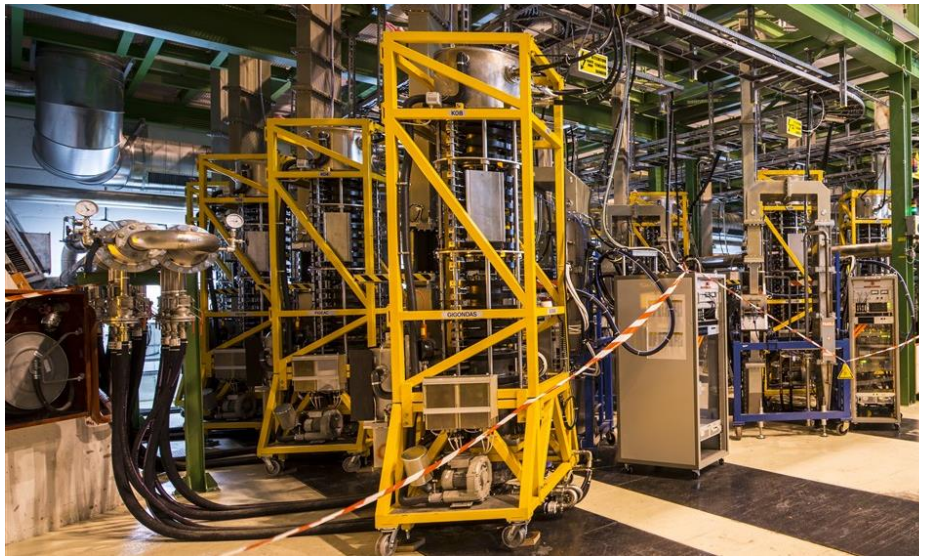
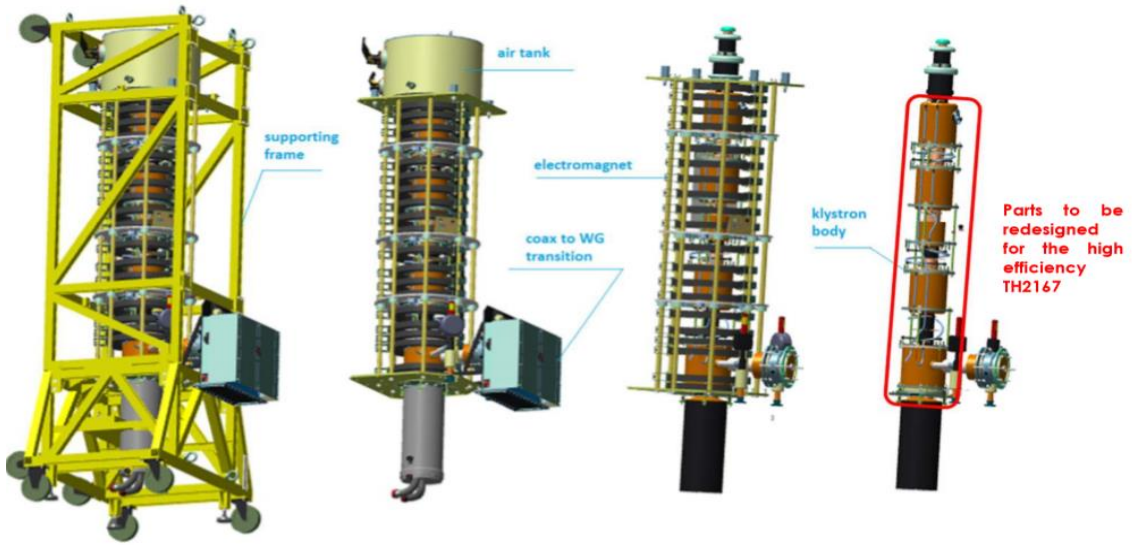
Objective

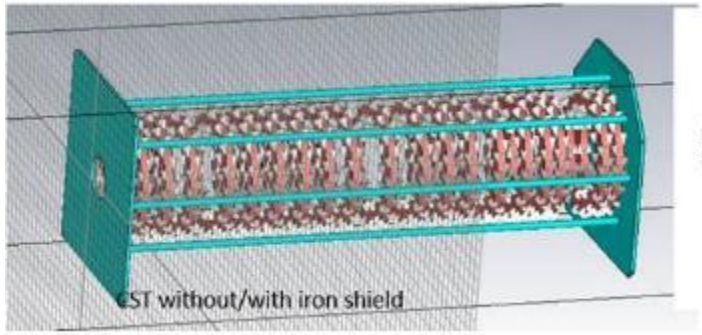
- Design and build an industrial prototype of the LHC klystron reaching 70% efficiency, in collaboration with THALES.
- In order to control the costs, the choice was made to retrofit the existing LHC klystrons, TH2167, with the aim of reusing some components (e.g. solenoid).
- Expected gain in DC to RF conversion efficiency: + 10 - 15 %

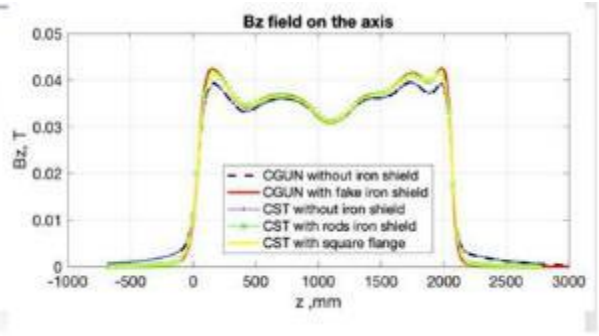


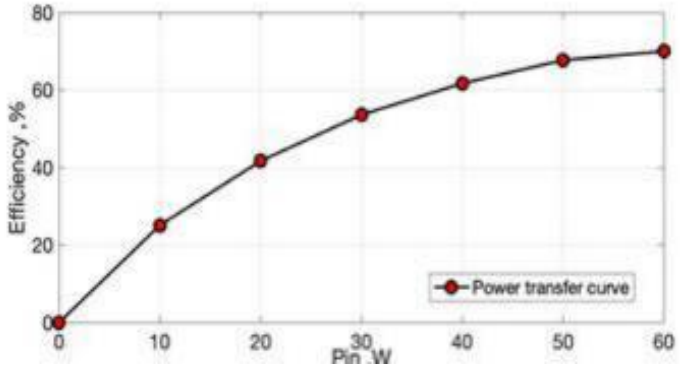


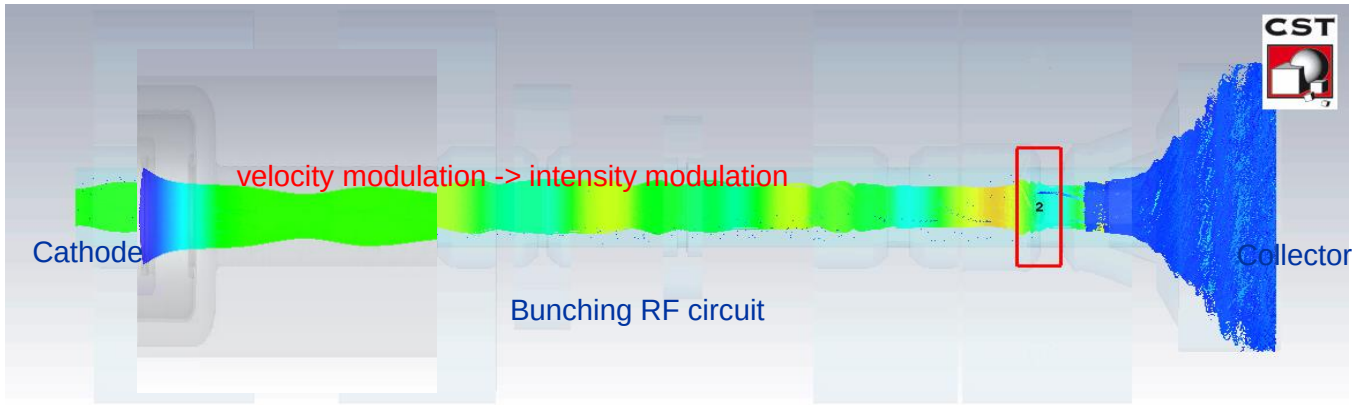
Simulation and RF design

- RF design fully completed (bunching RF circuit, collector)
- Power transfer, bandwidth fined tuned and magnetic profile optimized



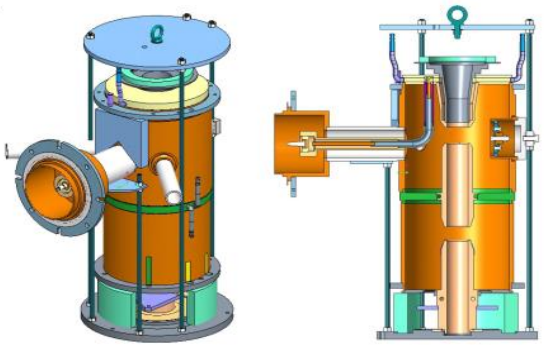


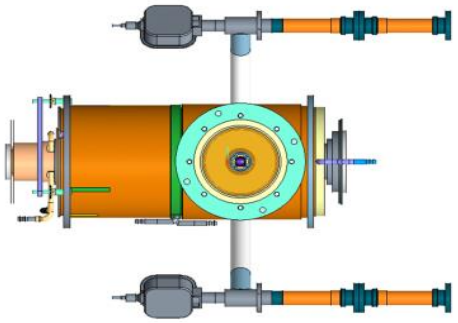


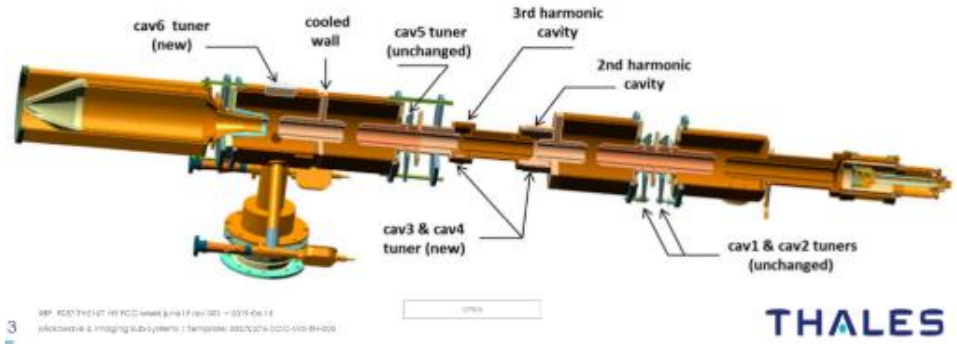


Towards construction

- All interfaces reviewed and defined -> ‘quick’ plug and play replacement of the LHC klystrons
- Mechanical design of klystron parts is well underway
- THALES’ activities are impacted due to material shortages -> delays ..
- The design review is foreseen end of March ‘23







Milestones, deliverables and schedule

- The project has accumulated important delays (9 months) -- missing resources & THALES

1. Preliminary Design Review only took place early October
2. Design report (CDR) -- March/April ’23
3. Factory acceptance test -- Q4 ‘23 -> delivery to CERN end ’24 ..

- Additional delays are to be expected