

WP4 - NA3 - Innovation, technology transfer, industry relation

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WP4:

devise and implement
a ROADMAP for
the INDUSTRIALISATION
of the HITRIplus
TECHNOLOGIES



Three main tasks to achieve objectives

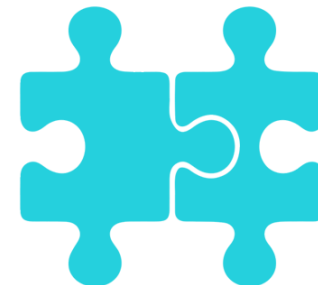
Task 4.1: Technology overview/assessment (CERN, GSI, INFN)



Task 4.2: Technology promotion (GSI, CERN, INFN)



Task 4.3: Technology matching (INFN, CERN, GSI)



Deliverables and Milestones

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D4.1	HITRIplus technologies and dissemination plan	4 - CERN	Report	Confidential, only for members of the consortium (including the Commission Services)	28
D4.2	Value propositions	7 - GSI	Report	Public	28
D4.3	Technology matching event	9 - INFN	Report	Public	36

January 2024  Done

September 2024  In Progress

Milestone number ¹⁸	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS4	First meeting of the Technology Overview committee	4 - CERN	8	Meeting of the Technology Overview committee, dedicated to the definition of the workplan.

November 2021  Done

D4.1: HITRIplus Technologies and dissemination plan

Deadline:
January 2024

- Identifies technologies from WP7-12 and presents them as commercial opportunities
- Showcases project benefits to European Industry
 - Heavy ion therapy as a business case
 - Benefits beyond hadrontherapy
- Identifies valuable opportunities for partnerships and co-development
 - Within the consortium
 - With strategically selected companies



The image shows the cover page of a report titled 'Deliverable 4.1 HITRIplus technologies and dissemination plan'. At the top left is the HITRIplus logo (Heavy Ion Therapy Research Integration) and the reference number 'Ref. H2020-INFRAIA-2020-1-RIA GA - 101008548'. To the right is the European Union flag. Below this, it says 'Horizon 2020 - INFRAIA-2020-1' and the HITRIplus logo again. The project is identified as 'Project: 101008548- HITRIplus' and 'Heavy Ion Therapy Research Integration plus' with the website 'https://www.hitriplus.eu'. The title 'Deliverable 4.1 HITRIplus technologies and dissemination plan' is in blue. Technical details include: Date: 16/01/2024, Due Date: 31/01/2024, Type: Report, Dissemination Level: Confidential, Work Package: WP4, Lead Beneficiary: CERN, Author(s): S.Muhr, and Contributing Beneficiaries: GSI, INFN. At the bottom left is another EU flag and a small text box stating: 'This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101008548'.

D4.2: Value Propositions - Targeted at companies

Deadline:
January 2023

HITRIplus Technology in the Report

PowerPoint Versions

Brochure Versions

- Description
- Challenge
- Solution
- Value
- Dissemination Route
- IP Protection
- Companies of Interest
- Action Plan
- Publications and Results



Compact Gantry Design for Heavy Ion Therapy

Challenge: The rotating center for delivering beams at the optimum angle... (text continues)

Solution: Taking the bold step of using superconductivity for the gantry, the generation of higher magnetic fields will allow for improvements in compactness, dimensions, weight, energy consumption and cost. The combination of superconducting magnets and HTS magnets and a detailed engineering design will be generated with smaller mechanical tolerances than other gantries to become competitive against other aggressive R&D programmes.

Value:

- 500 degree rotation angle
- Weight of about 300 tons
- Length below 30 meters
- Cost-effective construction of gantry systems
- Low power consumption for operation than current mature solutions
- Enabling an innovative gantry hybrid technology and focusing magnets, not separated located with about 40 cm. aperture with a field of about 5 T

I, Full Turn Gantry (FTG)

Challenge: A balanced structure with two side supports, driven by an electric motor (and optional directly mounted on the rail, also on the superconducting magnets) of the design of 1000 kV only for the addition of a central, thick superconducting magnet.

- 450° rotation angle
- 450° rotation angle
- Weight of construction: 300-400 tons

Value:

- 450° rotation angle
- Weight of construction: 300-400 tons

HITRIplus - GANTRY SYSTEM DESIGN

KNOWHOW AND EXPERIENCE DERIVED FROM DECADES OF ACCELERATOR DESIGN, CONSTRUCTION AND OPERATION. APPLICATION OF EXPERTISE AND KNOW-HOW TO INNOVATIVE GANTRY SYSTEM DESIGNS.

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VALUE

- A 360-degree treatment angle, saving processing time for patients compared to fixed machines and allowing for increased patient comfort.
- A reduction in gantry weight, dimensions and cost due to the use of curved superconducting magnets in the mechanical structure
- Construction target size of 12x6x9 m, a significant reduction compared to the HIT gantry
- Target weight of 100 tons for gantry (500 tonnes) or
- Reduced ecological footprint (CO2e, water, transfer time)

FULL TURN GANTRY (FTG)

CHALLENGE

A gantry, known as a device enabling the rotation of the beam lines around the patient, forming the heavy load-bearing structure, will divide the carbon ions for cancer treatments, only three of them feature rotating beam lines (allows the irradiation of the tumor from virtually any direction). The remaining machines rely solely on fixed beam lines (enable to irradiate, but require moving the patient to complete a treatment session, negatively impacting access to tumor, treatment time, and patient comfort).

Challenges for implementing gantry systems are associated with the size, power consumption, and cost.

Only one commercial solution has been developed so far (within Europe, the "HIT" gantry commercialized by Hitachi, while at the University of the European center, it is operation a heavy traditional gantry).

HITRIplus is aiming to develop a new innovative gantry design to change this.

SOLUTION

Taking the bold step of using superconductivity for the gantry, the generation of higher magnetic fields than other solutions will allow for improvements in its compactness, dimensions, weight, energy consumption and cost. Two prototype gantries are being developed, a more conservative one based on conventional "copper-based" magnets, and a more innovative one that is part of HITRIplus, based on "copper-free" magnets (CF) magnets. A detailed engineering design will be generated with smaller mechanical tolerances to allow European industry to become competitive against other aggressive R&D programmes.

- Value propositions for every technical WP:
- Available for presentations from the coordinator/technical WPs
 - Available for display on TV screens at conferences

- One brochure with 7 appendixes:
- Available for hand-out at conferences
 - Available on project website
 - Available for stream-out on social-media



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D4.3: Technology Matching Event

PTCOG 62
SINGAPORE 2024

62nd ANNUAL PTCOG CONFERENCE

10-15 JUNE 2024
SINGAPORE

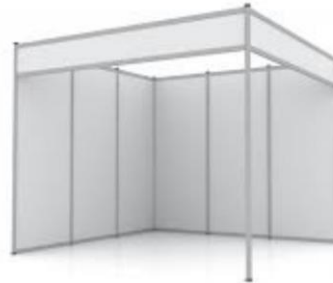
ptcog62.org
#PTCOG62



Marco Durante, PhD

- PTCOG (Particle Therapy Co-Operative Group) Chairman
- HITRIplus WP6 Leader

Deadline:
September 2024



The **HITRI** booth
Heavy Ion Therapy Research Integration

Participants: IBA, Leo Cancer Care, LinearBeam, Varian, Elekta, RaySearch Laboratories

PTCOG62 - Singapore

Suntec Singapore - Level 4



Maximum build-up height 4.00 m

SUBJECT TO CHANGE



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Results so far

- 12 HITRIplus Technologies Identified
- 3 Companies have signed the Memorandum of Understanding with the coordinator
- 19 Companies have expressed industrial interest
- 7 Value Propositions and one brochure for WP7-12 technologies have been produced targeting companies

Ongoing activities

- Communication and awareness of the HITRIplus technologies targeting companies on website and social media
- Active outreach to companies at conferences (PTCOG, and possibly ESTRO)
- Advising on usage of Technology Transfer Tools (e.g Legal Framework)

Contact WP4 (wp4@hitriplus.eu)

Reach out to us:

- If you want the Value Propositions for the identified HITRIplus technologies to present or communicate about the project
- If you want us to contact a company at PTCOG Singapore about a HITRIplus technology
- If you want us to communicate about any technical WP developments to industry
- If you need advice on IP protection or dissemination strategies

Happy to answer your questions

