FROM RESEARCH TO INDUSTRY

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MYRTE – WP2

Task 2.4
R&D on beam diagnostics for MYRRHA

STATUS

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WP 2.4 TASK GOAL

The goal of this task is to develop some crucial beam instrumentation that will be required to **operate the MYRRHA injector** in a reliable way and generating no false interlock during beam operation.

The **R&D activities** will focus on the following beam parameters:

- Beam Current Measurement (BCM)
- Beam Position Monitor (BPM)
- Emittance following projections XX', YY', XY', & X'Y with a 4D EMITtance-meter (EMIT4D)
- X-Y beam profile and feasibility study on a Bunch Length Measurement with a 3D wire-scanner (3D-WS)

SCK•CEN and Cosylab will take in charge the electronics interfaces.

WP 2.4 TASK STATUS

BEAM CURENT MONITOR :

- ACCT and FC design proposals were done.

BEAM POSITION MONITOR will be presented by Mohammed Ben Abdillah (IPNO)

- BPM qualification started in 07/2018 with offsets, sensitivity and phase shift measurements (powermeters & probes),
- Electronic qualification with BPM started in 10/2018.

EMIT4D STATUS will be presented by Aurore Dumancic (CEA THESIS SINCE 2017)

- Images analysis on going from Protons beam @ 3 MeV on IPHI: (Emittance measurement comparison with Tracewin + some optomechanics enhancements shall be performed)

2D WIRE-SCANNER will be presented by Dominique BONDOUX (CNRS/LPSC)

- First signal from Deutons beam @ 30 keV (not enough beam time)

WP 2.4 TASK STATUS

MYRTE WP2 Performance Indicators Table

Status on: 22-Oct-18

	2015, October 1 (Milestone #1)	2016, April 1	**2016, October 1 (Milestone #2)**	2017, April 1	**2017, October 1 (Milestone #3)**	2018, April 1	2018, October 1	**2019, April 1 (Milestone #4)**
Task 2.4	The detailed objectives of the task should be defined and the associated "performance indicators" table filled.	A BPM design should be available. The required instrumentation to be procured for measuring the beam current exiting the MYRRHA RFQ should be defined.	First test results on 4D emittance-meter should be available at low energy. Development of BPMs and current monitors should have started.	A generic state-of-the-art study on bunch length measurement should be achieved. Preliminary assesments on how to provide such a measurement using a wire scanner device should be available.	Current measurement diagnostics and BPMs to be used to measure the RFQ beam should be available, together with the associated electronics.	Current measurement diagnostics and BPMs should be installed after the RFQ, connected with control system and ready for beam operation.	The feasibility study of a wire-scanner able to measure bunch length should be available. The engineering design of 4D emittance-meter suited to 1.5MeV protons should be available.	The technology to be used for the different MYRRHA beam diagnostics shoudl be frozen. All design studies and test results should be gathered into Deliverable 2.5.

Complete BPM qualification on going: EXPECTED COMPLETION DATE IN MARCH 2019

EMIT4D design more suited with 3 MeV protons beam / 100 keV : NEXT TEST CAMPAIGN ON MYRRHA MOVABLE DIAGNOSTICS BENCH

Feasibility study on a Bunch Length Measurement with a wire-scanner not done yet, X-Y wire scanner are showing promising results: NEXT TEST CAMPAIGN EXPECTED IN JANUARY 2019