THE PREPARATIONS FOR THE NEW GANTRY 2 – A FIRST PROGRESS REPORT

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Within the PROSCAN project, there has been a large improvement in establishing a crucial schedule for the irradiation facility Gantry 2 and in preparing the experimental and therapy areas for their applications.

INTRODUCTION

As part of the PROSCAN project at PSI, the new Gantry 2 has the overall goal to optimise the irradiation and treatment techniques and to be prepared for a transfer into a marketable product for hospital applications. Even though no final decision has been made on establishing the new Gantry 2, the conceptual design [1], the planning and the preparations of the building facilities are being developed.

SCHEDULE

The new Gantry 2 project is generally being planned as one part of the PROSCAN project. In order to have direct information from the PROSCAN progress, the gantry schedule is linked to critical interfaces such as beam lines, control systems, civil engineering work and infrastructure. The structure of the project makes it rather complex. Many different fields including scientific work, medical requirements, engineering design, manufacturing and civil engineering must be taken into account.

In an initial version of the schedule the completion of Gantry II was foreseen near to the completion of the PROSCAN project. This schedule was only concerned with establishing Gantry 2 and did not relate to the different process steps of PROSCAN.

The two beam lines foreseen to serve the experimental area and the eye treatment area OPTIS will be installed in a later phase. Nevertheless, most of the concrete shielding blocks for these areas must be put in place in advance because of a steel structure platform for electronic racks which is partly supported on these blocks.

An intermediate experimental area with a temporary beam line layout will be prepared for irradiation tests on PIF (**P**roton **I**rradiation **F**acility) and for preliminary tests on the medical spot scanning treatment.

The next steps in the Gantry 2 planning will focus on the relevant milestones in the PROSCAN project and the usage of the intermediate experimental area.

THE EXPERIMENTAL HALL NA

The new irradiation facility Gantry 2 will be placed within the existing nucleon hall NA at PSI. The interior layout has been completely modified to obtain the optimal exploitation of the available space.

The pit for Gantry 2 is placed very close to the existing shielding wall of the Gantry 1 area. Because the ongoing cancer treatment does not allow extended therapy interruption, Gantry 1 will have to stay in operation during the whole rebuilding project. Therefore, this wall cannot be moved and must also stay in place during the pit excavation. Because of the heavy load from the concrete shielding blocks together with the three metres depth of the pit, this wall could become unstable. The adjacent ground around the hole will therefore be reinforced by concrete columns, which are established by a special injection process. In addition to the Gantry 1 shielding blocks, the pit will also have to bear the heavy load of the Gantry 2 structure; approximately 150 tons.

A bunker door will be installed at the Gantry 2 treatment area. This will be a sliding door unit with polyethylene shielding material (Fig. 1). According to the estimated dose rates, the door can be left open during patient therapy but will certainly have to be closed during dosimetry.

Fig. 1: The bunker door of the Gantry 2 therapy area. (Photo taken at the momentary storage place at PSI).

OUTLOOK

The coordination between the Gantry 2 and the PROSCAN project has progressed well during the past year. This is a very important factor for the forthcoming challenges.

REFERENCES

[1] E. Pedroni for the Gantry 2 working group, *Progress report on the development on a new gantry*; PSI Scientific Report 2002, Volume II.

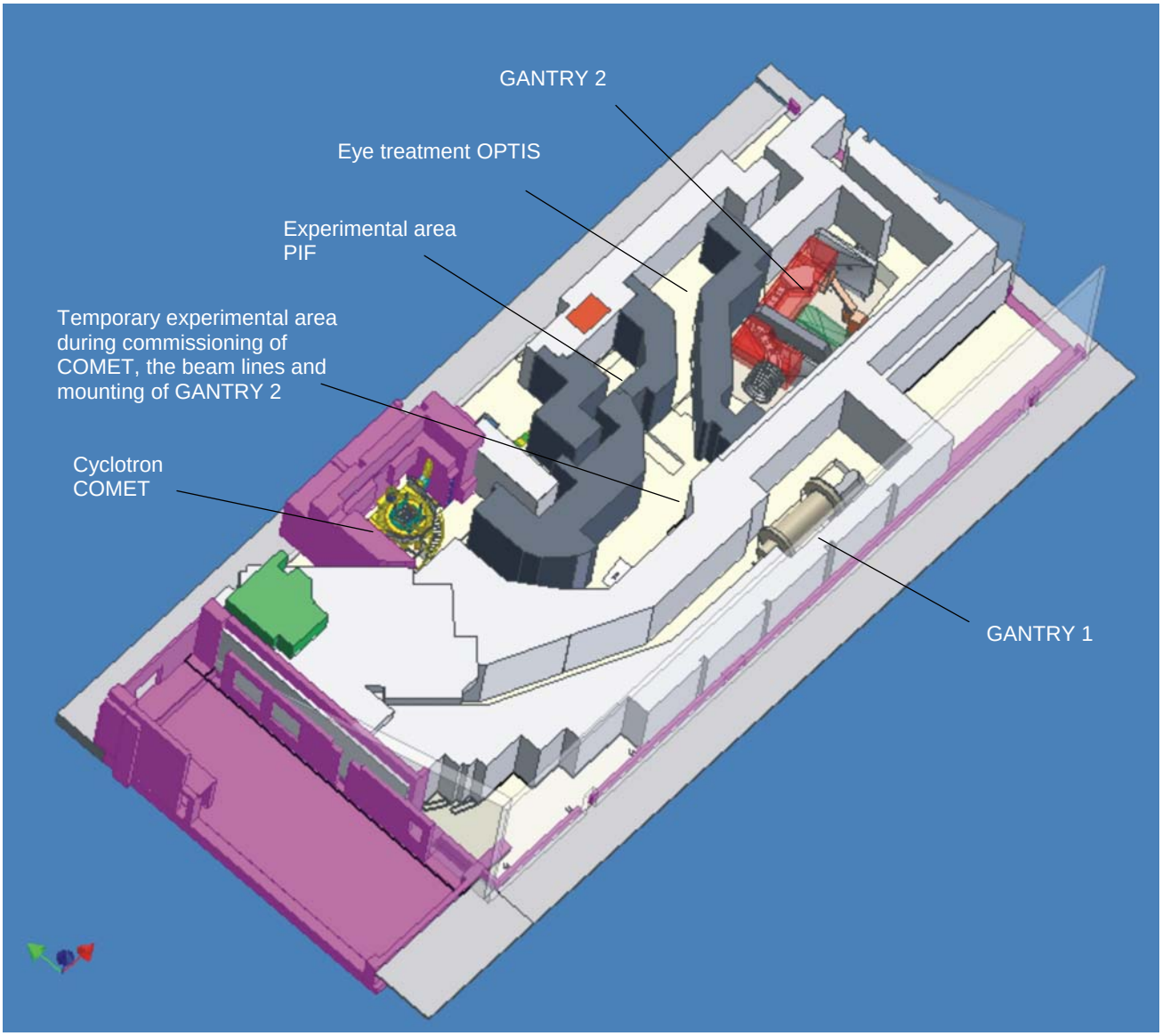

Fig. 2: 3D-Layout of the PROSCAN experimental facility in the existing nucleon hall NA.