23 May 2005

Mandate of a Working Group on

Physics Opportunities with Future Proton Accelerators (POFPA)

In preparation for the strategic decisions foreseen to be taken in 2006 and 2010 concerning future facilities at CERN, in liaison with the Inter-Departmental Working Group on Proton Accelerators for the Future (PAF), and in parallel with the R&D and physics studies on CLIC for a possible Lepton Facility, a working group aiming at the definition of the physics opportunities that could be provided by the possible development and upgrade of the present Proton Accelerator Complex is mandated below. The working group is composed of a convener, and about seven other members, most of whom will be drawn from the Physics Department, and will be accompanied by experts from other Departments and representatives of interested communities of scientific users. The group may create working teams on specific physics topics, in cases where existing studies need to be supplemented. The group reports to the DG; its findings will be discussed in the Executive Board.

The study will be based on the Fixed Target Physics programme recommended recently by the SPSC at its Villars workshop (CERN SPSC -2005-010), and is a natural extension of the previous analyses of physics opportunities with an upgrade of the LHC luminosity (hep-ph/0204087, published in Eur. Phys. J. C39, 293,2005) and of opportunities in neutrino, muon and kaon physics with a high-intensity proton driver made by the ECFA/CERN Study Group (CERN-2004-002, ECFA/04/230). Its scope is widened to include also opportunities in nuclear physics, based on the programme that will be recommended by the INTC at its future 'Villars' workshop in September 2005, in consultation with the EURISOL community. Close liaison with the PAF Working Group will be assured by the conveners of PAF and POFPA, who will nominate one member of each Working Group to attend the meetings of the other Working Group.

The POFPA Working Group will:

- **Assess the likely physics objectives of LHC upgrades and non-collider experiments** from 2010 onwards, taking into account the likely objectives of other physics laboratories.

- **Analyse the capabilities of the various development and upgrade options** of the overall CERN proton complex discussed by PAF to address these physics objectives, for each option and physics programme separately.

- **Identify any detector R&D** that would be needed if these experimental objectives are to be realized.

- **Identify synergies** of R&D with other CERN studies and projects, as well as with activities outside CERN.

- **Report to the DG** preliminary results from the above studies before the end of 2005. Subsequent discussions in the Executive Board should be helpful to define a priority orientation.

- **Define a preferred scenario** together with a suggested implementation schedule, staged in time, and provide a preliminary estimate of the necessary resources (budget, man-power and expertise) needed to carry out the corresponding experiments. A further presentation is expected by mid 2006 as an input for the critical decisions by the management in 2006 on a possible LINAC4. The preferred scenario will initially be rather tentative and will ultimately be formulated, around 2010, using the findings of this working group and taking into account the global status of high-energy physics plans and projects.

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