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PROPOSAL TO THE SPSC

STUDY OF CHARMED PARTICLES PHOTOPRODUCED IN EMULSION PLATES
 TAGGED BY THE OMEGA APPARATUS TRIGGERS

CERN¹-FLORENCE²- GENOVA³ COLLABORATION^(*)

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SUMMARY

An experiment is proposed to detect and measure the decay lengths between 10 and 2000 μm of charmed particles produced in emulsion plates or stacks. The secondaries from a photoproduced event in the emulsion are detected and registered in the Omega apparatus according to a preselected trigger.

For each trigger the interaction vertex is localized inside the emulsion in a fiducial volume of few mm^3 which then will be scanned in order to look at the presence of charmed particle decays.

We expect to have a relatively large number of electromagnetic background tracks inside the emulsion due mainly to the electron pair photoproduction and Compton effect from low energy photons of both the bremsstrahlung spectrum and synchrotron radiation.

It is possible to keep the density of tracks under an acceptable value by using a large emulsion volume. A mechanical device will be able to drive an emulsion plate in the target site leaving it there during the burst time (700 msec) and soon after replace it by a new one just in time for the next burst 6 sec later. Due to the relatively high charm photoproduction cross section (300 nbarn in H_2) in 7 hours by 2 10^7 triggers of the kind of 7 charged tracks + 5 with a K meson one can get 180 charmed particles.

The fast off-line data selection based on prompt electron identification gives a strong charm signature. Events with signature like that if any should be the first to be scanned. The maximum total emulsion volume expected to be exposed to the tagged photon beam is 20 liters.

Spokesman: G. Diambrini Palazzi

(*) The emulsion exposure will be supported by the Electron-Photon Collaboration (Exp. WA 4)

Subject to approval of the INFN Italy

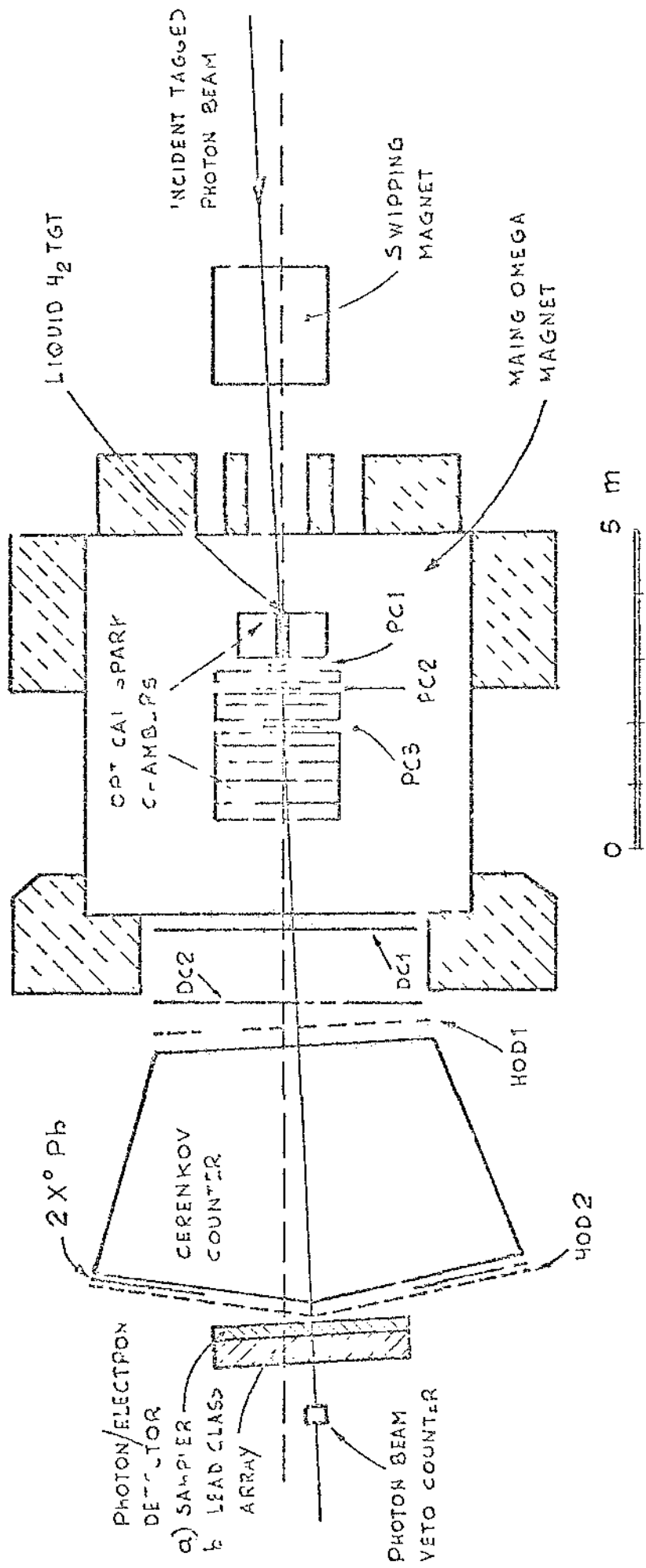


Fig 2 - Experimental layout of "Omega" apparatus for charm photoproduction in Hydrogen