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Philips Proposal for a Smart PMT

Note on Philips Proposal for a Smart PMT

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Dieter Dau phoned me on 4/25/82 to say that he had received a phone call from S.O.Flyckt of Philips, (Eindhoven) with a suggestion for a new idea for a smart PMT for DUMAND. The idea was inspired by the preliminary report on the DUMAND 1982 Signal Processing Workshop. (N.B. Flyckt was one of two PMT manufacturers' representatives with whom I discussed the DUMAND PMT requirements at the October meeting of the Nuclear Science Symposium in San Francisco.)

The idea is to build a two-stage image-intensifier type of structure. The first stage would have a 16" hemispherical photocathode, and would produce a much smaller plane image. An accelerating voltage for the image stage would be 25kv (it probably can be lower). The electrons strike a phosphor screen, and each one produces many hundred photons. The back side of the transparent screen is the photocathode for a small PMT.

With even a low-efficiency fast phosphor, this scheme will produce at least 25 photoelectrons per incident electron. The image stage is thus a high-gain first stage, allowing the PMT to distinguish events with one primary from those with two or more. We have previously considered such schemes too expensive; Flyckt claims he can build such tubes for $3K, which would certainly put them in the running.

I asked Dieter to get Flyckt to communicate with us; Flyckt was worried lest he might already be too late. He will be reassured.