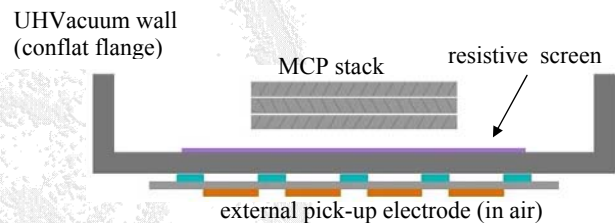


Novel particle and photon counting detector

Based on **RoentDek's** well-established single particle/photon counting delay-line detector technique, we have developed a novel complementary read-out concept for MCPs which allows for a mounting of the read-out anode outside the vacuum.* This technique is especially suited for flange-mounted particle/photon detectors and sealed photo-multiplier tubes (so-called image intensifier operated as **TSCSPC: time- and space-correlated single photon counter**). In both cases, the mechanical design of the detector head is much facilitated compared to the use of alternative read-out anodes. Also it is easy to maintain the anode function or even swap anodes/read-out methods while the detector head remains intact.

The features of this novel detector type can be summarized as follows:

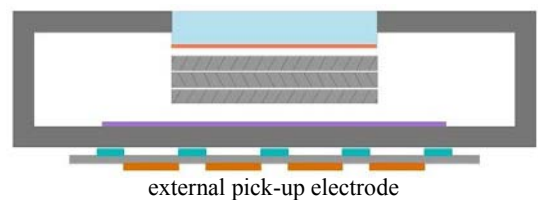
- **true single event counting**
- **extremely low background**
- **unlimited dynamic range**
- **position resolution 50 micron**
- **easily reconfigurable air-side read-out anode**
- **open area of 40 or 25 mm**



and in combination with the patented "**Hexanode**" delay-line read-out:

- **time resolution 100 ps**
- **throughput: 1.000.000 particles/photons per second**
- **detection of multi-hit events**
- **List-mode event storage with X,Y,T information**

MCP-PMT with photo cathode and resistive screen



Other specified read-out methods include

- **Wedge-and Strip/Tetra-Wedge Anode**
- **Resistive Anode Encoder**
- **Pixel/strip arrays**

Currently, the function of 40mm and 25mm prototypes have been specified and reached the stage of productivity.

The detector head for **particle or VUV/X-ray photon counting** consists of a MCP stack on an image-charge-transparent conflat flange (CF).

Photons with **visible/near infrared wavelengths** are counted by a similarly constructed **MCP-PMT**.

Please contact us for further information.

Literature: Czasch *et al.*, Proc. **SPIE** Vol. 6771 (2007) 67710

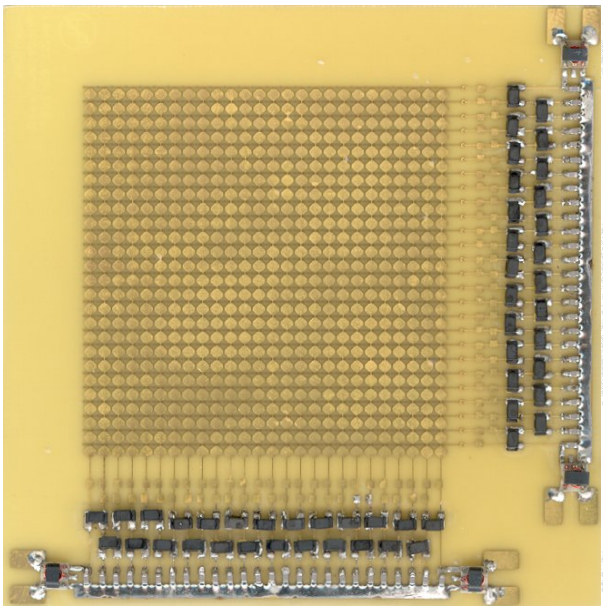
* patented technology

Preliminary test results:

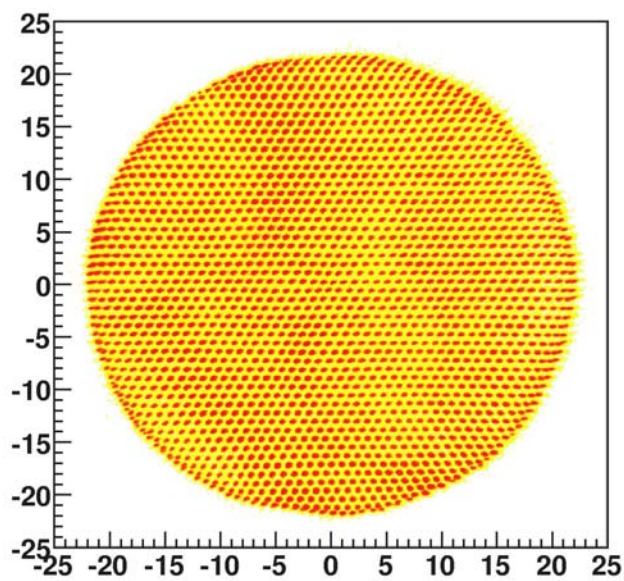
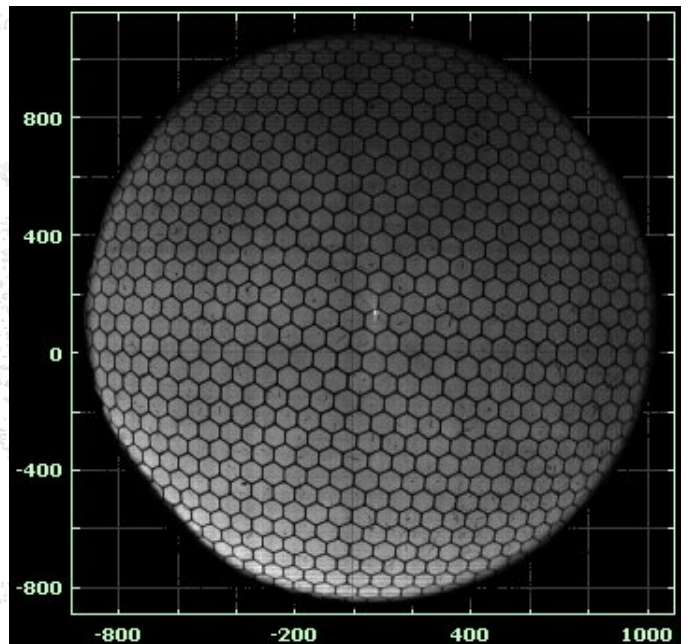
RS-MCP40 detector on CF63



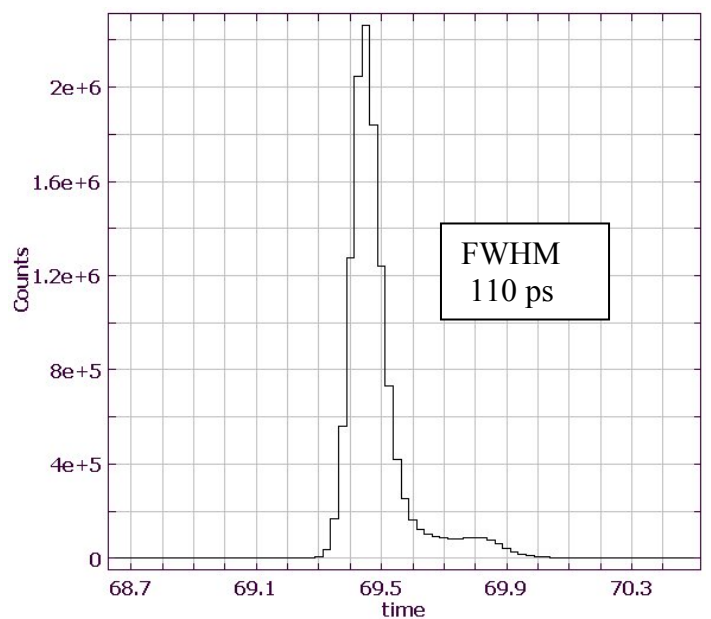
RS-PMT25 (for TSCSPC)



LC delay-line anode



Intrinsic linearity calibration with Hexanode



Photon counting with high position & time resolution