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Development of the Glass Micro-Well Detector (g-MWD)

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We describe the fabrication and performance of large area glass micro-well detectors (g-MWD) fabricated using APEX® Glass. These microstructure, two-dimensional proportional counters are 85x85 mm² square with an array of 100 μ m diameter wells, 100 μ m deep, on 200 μ m centers with crossed anode and cathode electrodes. Their performance in P-10 at 1 atm shows excellent gas gain and stability. Future work will refine the g-MWD fabrication process, demonstrate tiling these detectors to make larger area detectors, and lifetime testing in a closed gas environment.

The g-MWDs are being developed for the Advanced Energetic Pair Telescope (AdEPT), a discovery mission for medium-energy (5-200 MeV) gamma-ray polarimetry, but applications are envisioned in a wide range of medical, military, and homeland security applications.

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