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Metal Microstrip Detector for the Beam Profile Monitoring

The Metal Microstrip Detector (MMD) is presented. The MMD is designed and used for on-line profile monitoring of synchrotron radiation beams. The results obtained at HASYLAB (DESY) with 20 keV synchrotron radiation are discussed. The principle of its operation is based on the Secondary Electron Emission (SEE): X-ray photons (or fast charged particles) hitting a narrow (20-35 μm) metal strip with thickness 1-2 μm initiate SEE. Consequently generated positive charge in the strip is integrated by high sensitive Charge Integrator (CI), forming output signal proportional to the energy and intensity of the initial beam. Such signals are collected from 32 equal strips, processed by software representing current beam profile on PC. Also MMD can be used for profiling of charged particles beams. The main advantages of MMD are: extremely low mass of detecting material, very high radiation tolerance (at gigarads level) and good position resolution (20 μm now and smaller by order in the nearest future).

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