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Cloud Computing for QA of MPGD GEM-foils using Image Analysis

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This work presents the design and development of cloud computing services for Quality Assurance in GEM-foils (electrodes of a GEM-like detector) through the analysis of high resolution images. The platform analyzes images uploaded from anywhere through the web and executes an automatic measurement of the micro holes geometry presented in the GEM-foils, in order to detect and quantify different kinds of defects. Using techniques of High Performance Computing the platform performs this task in milliseconds for a standard GEM-foil of 10 x 10 cm. The diverse cloud services provided by the platform can detect variations of the micro holes geometry in a GEM-foil with an accuracy of one pixel = 1.75 μm or less, depending on the images resolution. The diverse measures extracted from every hole in the GEM-foil makes this service a valuable and functional tool for R&D which can help to define practical standards of correlations between GEM-foil qualities measured through high resolution images and its operation in a detector. The defect identification and Quality Assurance using cloud computing can also be used in the manufacture and industrial fabrication of GEM-foils.

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