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## Development of a 1D Triple GEM X-ray detector for a high-resolution x-ray diagnostics at JET

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ITER-oriented JET research program imposes new requirements on the high-resolution X-ray diagnostics instrumentation (KX1) for the impurity monitoring. Therefore, in addition to the upgrade of the Ni monitoring diagnostics system, one has to design and construct a new diagnostic instrument implemented in the same KX1 spectrometer for W impurity monitoring. Both, Ni and W characteristic X-ray lines at 7.8 and 2.4 keV, respectively, will be measured by new generation energy-resolved micropattern gas detectors with 1-D position reconstruction capability. The detection structure is based on triple GEM (T-GEM) amplification structure followed by the strip readout electrode. Each detector will consist of the strip readout plane with 0.8 mm pitch (256 strips in each detector). The analog signal processing electronics should allow on-line energy measurement and position reconstruction with the precision better than the strip pitch. The monitoring system should allow the measurements of the plasma evolution in time-slices corresponding to 20 ms exposures. Two such processing units dedicated to the 'low-energy'(2.4 keV) and 'high-energy'(7.8 keV) X-ray emission will be installed at KX1 at the end of 2011. The main objectives and characteristics of the new detectors for the KX1 diagnostics are described. The first laboratory tests of the prototype T-GEM detector are also presented.

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