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Neutron Counting and Gamma Spectrometry with MCA-527

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The digital MCA527 was developed by GBS as follower instrument for the MiniMCA-166, which cannot be produced any more due to missing electronic chips. The instrument was successfully tested for use by IAEA and EURATOM safeguards inspectors [test report].

In the course of the tests it was understood that this same piece of hardware can be used for correlated and multiplicity counting as well. A dedicated firmware version and user software, WinTimeStamps, were developed by the instrument provider. Test results for this application show that the instrument, operated in its basic mode ("EDGE"mode) fulfils the requirements for correlated neutron counting. Due to the fact that the MCA527 is not a dedicated neutron counter but a multichannel analyzer it is slower than established neutron counting devices; however this is of no real relevance for most of the safeguards inspection applications.

Further study of the signal flow resulted in the development of a new signal evaluation method which integrates rather than counts TTL signals. The method is implemented as "Advanced High Count Rate"mode ("AHCR"mode). In this mode the MCA527 is faster than the other established neutron counters. The paper presents some relevant measurement results.

Country or International Organization

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