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## Mössbauer spectrometer with high channel resolution utilizing real-time industrial computer

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New Mössbauer spectrometer based on CompactRIO platform was developed. CompactRIO is a modular industrial computer platform developed by National Instruments. This device runs “LabVIEW RT OS”- Linux-based Real-Time Operating system, which has support of LabVIEW programming environment. CompactRIO has integrated FPGA (Field Programmable Gate Array), which was used for most critical functions of the developed spectrometer, such as scintillation detector signal acquisition, accumulation of Mössbauer spectra and for driving the velocity transducer movement using PID (proportional–integral–derivative) regulation. Velocity Transducer modulates the gamma ray energy by movement using the Doppler effect. Precision of this movement is crucial, as it defines whole spectrometer accuracy. More complicated algorithms as PID parameters autotuning using genetic algorithms and additional Mössbauer spectra linearization methods implemented in developed Mössbauer spectrometer are performed on the Real-time part of CompactRIO. Developed spectrometer shows the advantages of Real-time systems such as deterministic processing of large amounts of data, which allows measurement in very high resolution.

### Minioral

Yes

### IEEE Member

No

### Are you a student?

No

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