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NEW RING DETECTOR FOR SMALL-ANGLE SCATTERING OF THERMAL NEUTRONS FOR REAL-TIME DIFFRACTOMETER (RTD).

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The development of the detector is based on the design and experience of working with a one-dimensional coordinate-sensitive ring thermal neutron detector, protected by copyright certificate, which allows measurements of the spatial distribution of thermal neutrons scattering from samples in 8 discrete coaxial rings.
The new ring detector is designed for measure small-angle scattering of thermal neutrons at the IBR-2 reactor, DN-2 diffractometer (channel № 6a).
Structurally the detector is divided into 9 independent equidistant coaxial rings. The cathodes of each of the rings are divided into 16 independent sectors, the same for each ring.
Registration signals are taken from the anode wires (common to every single ring) and with each of the 16 cathodes - 153 independent detectors.
The cathodes are located with inner side of rings and have a rectangular shape, their length being a function of the radius of the corresponding ring. Thus, each separate cathode segment takes position ~ 1/16 of the total angle 2π of any ring counter.
This innovation made it possible to introduce a new coordinate as a measurement parameter.
The analog electronics is mounted inside the volume of the detector on an accessible place for maintenance.
Due to its feature in design, the detector is a suitable tool for any researches in which angular or axial anisotropy of the scattering of slow neutrons can be observed.

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