

## **Development of multisector pulsed neutron logging tool constructional parts**

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### **Abstract**

© 2016, International Journal of Pharmacy and Technology. All rights reserved. This paper focuses on the results of mathematical modeling aimed to construct multisector pulsed neutron logging (PNL) tool, which can be used to locate the cracks that are formed during hydraulic fracturing operations. This project resulted in a model of multisector PNL tool containing 6 detectors placed in such a way that they are equidistant from the source. This paper also presents: a. optimal collimation design providing detection of neutrons from specific formations; b. model allowing to assess the quality of collimation in multisector logging tools; c. optimal detector configuration for the multisector PNL tool. The project results have also shown the possibility of increasing the number of registered thermal neutrons by introducing special constructional parts into the PNL tool design, allowing to change direction of the neutron flux from the source into the area adjacent to detection units. Consequently, special constructional parts for the multisector PNL tool were modeled to increase the number of neutrons recorded and determine the azimuth of the hydraulic fractures.

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### **Keywords**

Hydraulic fracturing, Neutron absorption, Neutron collimation, Neutron moderation, Pulsed neutron log