Investigation of disc choppers for Tehran research reactor neutron diffractometry system using VITESS3.3A code

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Choppers

Choppers are devices for converting a continuous neutron beam into a pulsed beam by passing the neutron through a rotating slotted disc or cylinder.
Disc chopper
Schematic of a Fermi chopper
Fermi chopper
Schematic of a $T_0$ chopper
Disc chopper simulation for TRR: using Vitess3.3a code

Chopper radius: 31 cm
Window height: 15 cm

Neutron chopper, opening window: 45°
Different disc chopper rotation speeds
Comparison of low and high rotation speeds
Disc chopper high-speed rotation effect on pulse width
Fermi chopper
Fermi chopper energy contamination
Direct Fermi chopper

Neutron flux (n/s cm²)

Neutron wave length (Å)

500 rpm

rotation axis
Direct Fermi chopper energy contamination
Conclusions

The Vitess results need to be benchmarked with the experimental data

The F beam tube of TRR can be equipped with Disc and Fermi choppers for producing a monochromatic beam.
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Rudkhan Castle
A nice place in Gilan province in Iran

Thanks for your kind attention