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ALLEGRO Core Neutron Physics Studies

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Status of neutron-physical analysis of ALLEGRO - demonstrator of the gas cooled reactor is characterised at this article.
Benchmarking of existing neutronic codes utilised for PWR analyses mainly, is first task, solved at running projects. As there are available no neutronic experiments with He coolant at fast spectrum, code to code comparison was selected as first stage of validation process.
First ALLEGRO oriented neutronic benchmark was split into two phases. Definition, solution and partial conclusions of first phase concentrated on pin calculation - Methodological benchmark with simplified geometry for the group constant generating tools - are described at the article. Definition of second phase oriented on assembly calculations and its first evaluations are treated as well.
Evolution of ALLEGRO core evolution is driven by two factors - problems with DHR proportional to power density and by better availability of UOX fuel for first cycles (in comparison with MOX). First round of calculations oriented on fuel and power density optimisation including resulting direction of core modifications is characterised in the paper.

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