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Parallel between natural Oklo cores and industrial reactors operating

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TThe first man-made nuclear reactor was developed by Fermi at the University of Chicago and was first started in December 1942. This was the confirmation that one is able to use sustained fission reactions to produce energy. Following this success, the many types of nuclear reactors studied have given rise to several families of reactors corresponding to different orientations and technical choices. They are linked mainly to the choice of fuel (natural uranium, enriched uranium, plutonium), coolant (water, carbon dioxide, helium, sodium), fast or slow of neutrons and moderator for slow neutron reactors (graphite, light water, heavy water).
Out of all these choices the Pressurized Water Reactor (PWR) family is the closest to the Oklo natural reactors. Many intriguing similarities are observed and discussed in the present Supplementary Information C. Our present-day understanding of the PWR operating conditions has been a great help for understanding the Oklo reactors. On the other hand, the fast neutron reactors can also be put in parallel to Oklo cores since they did breed significant amount of plutonium-239 and since some zone are known to be operated as fast neutrons. The presentation will set a parallel between what Nature offered us with Oklo cores and the optimized cores we are able to build and operate.

Auteur principal: Prof. GALL, Benoît (IPHC Strasbourg)

Classification de Session: From Oklo samples to natural core simulations