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A « Water Motor » With an Accelerator, Water With High Natural Radioactivity and Fission

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Abstract

The concept relies on the most recent innovations in laser spallation of neutrons altogether with the naturally radioactive waters available in profusion to develop fission power and propel a vehicle. It consists in a subcritical fission core of a new type designed to make use of the small but existing period in which low-weight radioactive elements, after neutron capture become fissile.

Introduction

The cross sections for fission of elements lighter than 226Ra can be estimated. 222Rn, after neutron capture, as 223Rn will have a half-life of less than 3 seconds (2,3 to 2,7 seconds, average 2,35) and a cross-section with thermal neutrons of 10 500 to 12 000 barns. To take opportunity of this cross-section, that will produce a fission energy obviously slightly less important (about 140 MeVs), it is needed to spallate neutrons in a mix in which thermalisation is possible altogether with fast neutrons and this is ensured only in a relatively small medium.

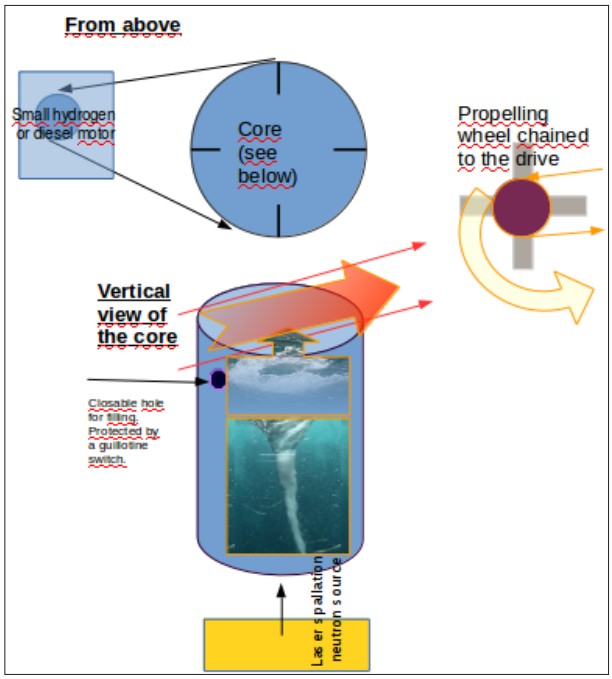
The core itself relies on Fermionic condensation under centrifugation. It is the combination of a centrifugation unit and of a subcritical reactor. The mass of the heavy isotopes that are to be enriched with neutron capture before fission helps to bring them closer to the spallation source, that is under the spinning core. The spinning core creates a whirlpool that accretes the alpha emitting nanoparticulates in its bottom, very close to the spallation. So the resulting neutrons have a short path in water and are still quite fast when they meet the alpha emitting nanoparticulates. Allowing a good capture yield. Then the atoms are immediately available for fission with neutrons that have done a longer path in water. This allows to heat up, above the core, a typical water loop (a large tube with flaps ideally also descending somehow along the edges to better take up fission heat) directed into a propelling turbine for chaining onto, for instance, the wheels of a small vehicle.

A guillotine switch has to be installed just along the opening on a side of the core for straight, hermetic closing after filling. The core must be made of tungsten carbide, and the switch as well. Within the core, small winglets along the walls (three at least, four in the depiction below) will help spin the water faster.

Salt (NaCl) should be added to high natural radioactivity water to foster a better ratio of fast neutrons. Salt is easily available and both Na and Cl will also produce spontaneously, thanks to the alpha activity, some neutrons. The data in Vlaskin et al. (2015) indicates that for 7,8 MeV alpha particles, Na yields neutrons to 1/11th of the ratio of Be. Cl will make a small supplementary contribution. A laser spallation source is nevertheless essential to make use of the whirlpool by targeting it from under.

Laser Considerations

Whereas as stated above one may want to avoid the costs of a laser spallation source by using lots of NaCl, hoping that very powerful centrifugation, acting as an accelerator of alpha particles would spill enough neutrons for a fission reaction, this does not make full use of the opportunity of the whirlpool accretion of radioisotopes.



A dual neutron source is proposed. It will combine a laser of electrons, for catapulting directly neutrons from W through their energetic impact, and an alpha particle source with a photon laser. The purpose is to compensate the loss of neutrons of the tungsten bottom of the core with an intake of alpha particles, whose positivity is in turn compensated by later electron impacts. For the laser of electrons see Khai et al. (2009) and for the alpha particle source and its primitive accelerator (Akopyan et al., 1990). The alpha particle souce should obviously not be used at the same time as the laser of electrons, or it will deflect a large % of the electrons, reducing strongly its efficiency. Alternatively to an alpha particle neutron source, the tungsten bottom may simply be periodically reinforced with a new tungsten layer. A faster electron beam with a portative accelerator source can be achieved with (Sapra et al., 2020).

Vehicle Design

Thinness of the outer layers of the tungsten carbide cylindrical core (except somehow for the bottom part) is important. The waterloop directed to the drive would ideally cover more than the top of the centrifuge, descending also on both sides (as an extended, inverted U) to better capture the thermal output.

Experiments will show, dependings on the volumes of either tap water from areas of very high natural radioactivity enriched in NaCl, or sea water, the energy production. The use of hemp for the full hull (chassis) of the vehicle would certainly improve the efficiency strongly.

There obviously is an accelerating factor in the core, with salt introduced, in that the fission activity will compress alpha emitters into the Na atoms leading to the production of supplementary neutrons. The control of the activity in the core depends on both the spinning from the centrifuge motor and the laser under. As slower neutrons will fission more efficiently the enriched radioisotopes, it is possible that slowing down the laser and the centrifuge will increase, perhaps very significantly the fission rate in the core. This factor is reduced with NaCl increasing but certainly the use of pressure chambers to accumulate compressed water vapor in excess from these periods, could be thought of.

With a cylindrical core and 8 liters of sea water, it can be hoped to achieve 60 kilometers / hour on a flat road with two passengers (no luggage) and 20 hours of autonomy at that speed with a 100 MeV laser accelerator. This is reduced to 8 hours at 60 km/h with high natural radioactivity water from the Badoit spring (before filtering but with addition of NaCl, 30 grams / liter), 6 hours from the Contrexéville spring (ibid), 15 to 16 hours with the waters of the Vichy area (ibidem). All these waters are usually filtrated from a large % of the alpha emitters before bottling and the estimates are made without that.

These numbers spill from mind estimates of the author, and the theoretical case of a light hull in hemp together with an architecture that reduces the drag.

It may be possible to do better yet at your own risks. Water acceleration is also possible directly in a closed loop onto which the lasers point directly – the naturally radioactive water being accelerated by fission within and directly aimed at a turbine taking its energy. A long horizontal tube with a laser source on a side is proposed. The laser should point at the side opposed to the output area that expels the waterflow onto the turbine.

After use

The cylindrical core needs to be periodically emptied of its water, for renewal of the fuel, but fission products can stay for a long period and still benefit somehow to the core. This is an important point. Indeed, in addition to their decay energy, the beta- emission from fission products in the bottom part of the core contributes to attracting alpha emitters (for particles in suspension, with some atoms decaying attracted by the beta - emission) closer to the laser source. Thirdly, the winglets in the core, if they are made of tungsten carbide, which is recommended, will be a small source of photoneutrons with some fission products (131Cs typically). The fissionned water could be evacued with a hose before refill, over 6 to 7 cycles before the accumulation at the bottom may begin to reduce the efficiency of the laser spallation in a way that still is not contradictory with later use. Experimenting with patience is recommended. It is even possible that the phenomenon observed in nuclear fission with quarks will allow the reconstitution of some alpha emitters from fission products thanks to the formation, under full core activity, of some antigravitons (Pirot, 2021). The formation of antigravitons was observed in a Fermionic condensator (the subcritical core presented in (Pirot, 2021)) rotating at full speed without its energy being taken for any power output, obviously in plutogenization mode. This has caused a deviation of a nearby aerojet, that

crashed on it . In usual nuclear reactors, the fuel is tightly held, so it cannot get compressed onto itself, which is the condition for the interstitial particles to change shape and adquire the anti-down nature at least temporarily. But in subcritical cores where the fuel is freely floating, with the Bose-Einstein and Fermionic condensation, this is possible during periods of *sustained* activity.

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[1]The case is not entirely clear. A few months ago a video on the 2019 crash of an helicopter in Mali was published, with French military media showing militants with a heat source matching closely a Fermionic subcritical core in full activity without any machinery nearby using its energy shown in infrared vision– inconsistent with the initial writing and submission of the article in March 2020. A Mirage 2000 crashed in Mali in July 2021 and the video is obviously mixing the two events. It shows a small but very heavy plume very indicative of a depleted uranium-loaded core after the crash. The formation of antigravitation in the core in plutogenization mode, from a phenomenon very easy to explain with [5] is the only explanation for the uncoupling of the aircraft from its path and crash directly onto the core.