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The design of an igniting agent for fusion energy systems ver2.51

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Single-layer graphene is currently produced on an ongoing basis to meet the demands of researchers. In recent years, there have been significant discoveries regarding the unique properties of this material, one of which is the generation of plasmons in graphene in response to excitement in the THz frequency range. Based on this concept, the present paper proposes two possible designs for a fusion energy ignition agent. These concepts could potentially allow fusion ignition at lower energies than are currently possible.

The basic concepts on which these designs are based are as follows.

1) The Coulomb forces associated with ionized deuterium and tritium nuclei are negated by the formation of higher energy plasmons around these nuclei.

2) The electric field has its highest value at the regions indicated by the yellow points in Figure 1. Consequently, ionized fuels would be expected to migrate towards the closest yellow points from both sides.

Figure 1. Diagrams showing three views of the "Nano Sandwich"™ concept for a nano-scale igniting agent in which fusion fuels are separately sandwiched between three graphene sheets.

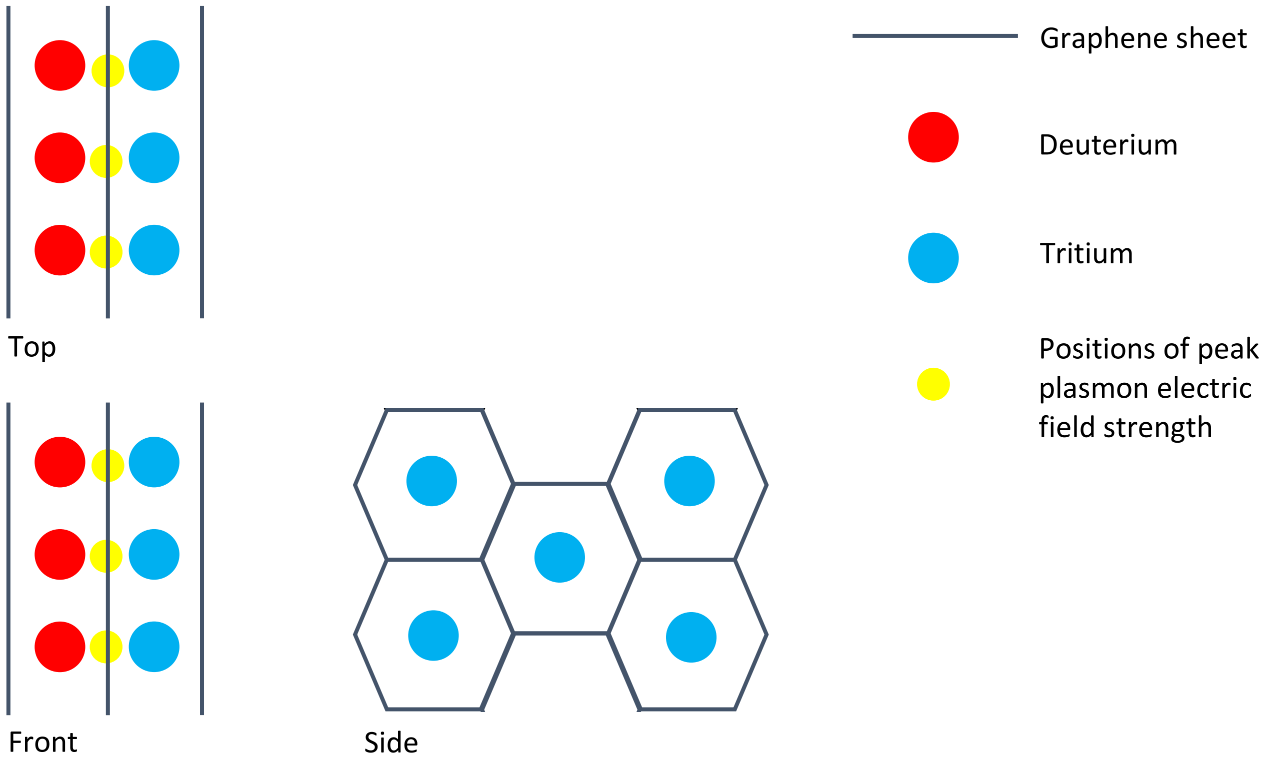
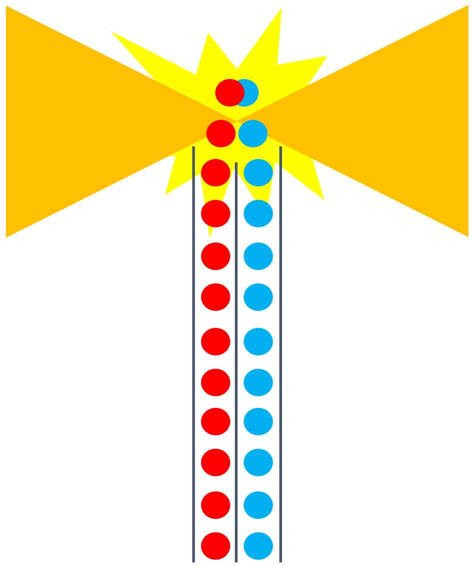


Figure 2. A diagram of a reactor design in which THz laser pulses are imparted to a vertical "Nano Sandwich" unit from either side[1].

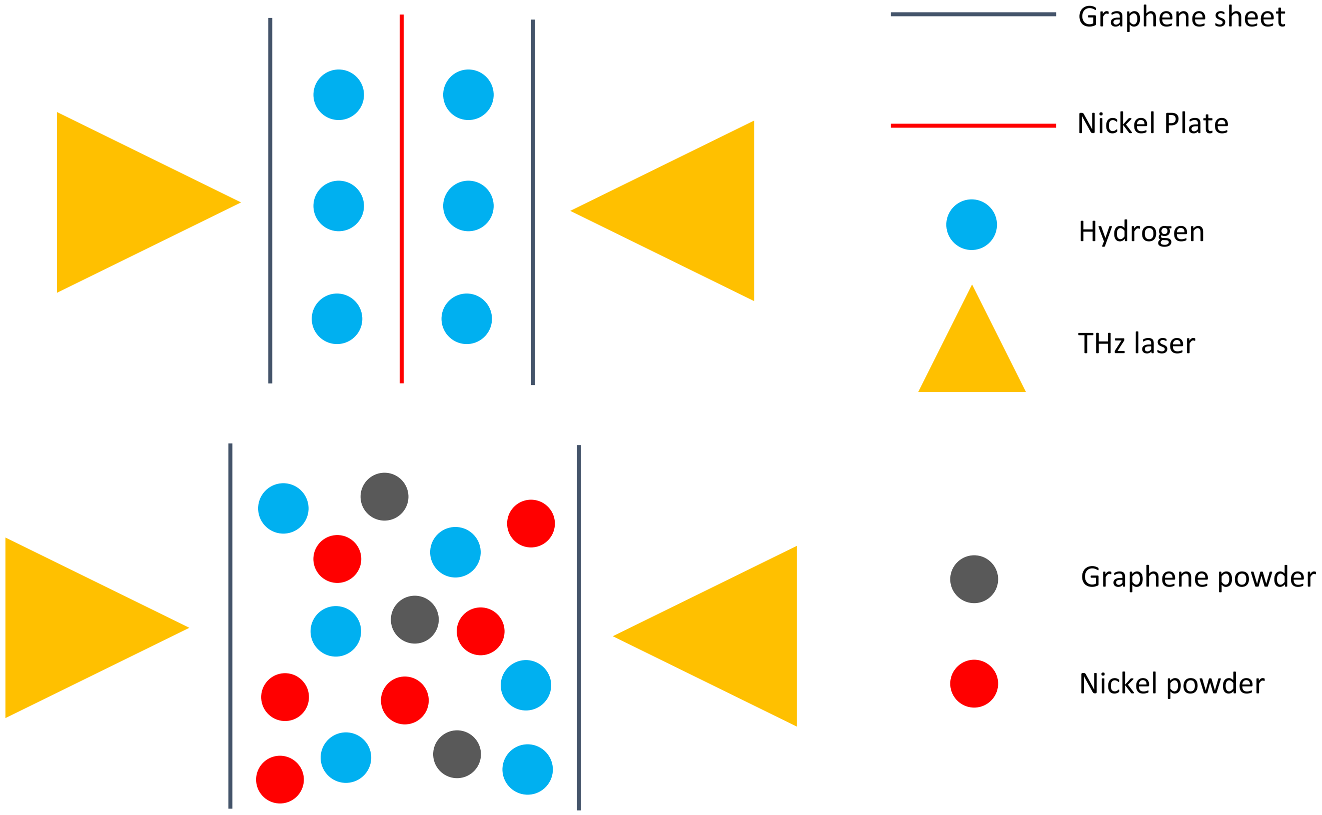


[1] The author's essay titled, "Have We Found a Breakthrough on Potential Catastrophes?" published in 2014, the author discussed previous developments in nuclear fusion research.
https://s3.amazonaws.com/fqxi.data/data/essay-contest-files/Furui_b133fe.pdf

Appendix: Application to Low-Energy Nuclear Reaction (LENR)

The purpose of this appendix is to explore the possibility of using the nano sandwich concept in conjunction with LENR, based on Widom Larsen theory[2]. By doing so, we may be able to harness the energy released from beta-decay electrons. If successful, this could provide us with a source of electrical power or heat, which could potentially be used as a sustainable energy resource. Our device design involves using either nano-plates or nano-powders made of nickel or other elements, combined with hydrogen, to initiate the reaction[3]. We propose utilizing graphene[4] sheets and powders as plasmon generators.

Figure 3. A diagram of a reactor design in which THz laser[5] are imparted to a vertical "Nano Sandwich" unit from either side.



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[2] One of the most plausible explanations for the excess heat observed in LENR.
A. Widom and L. Larsen, Ultra low momentum neutron catalyzed nuclear reactions on metallic hydride surfaces, *Eur. Phys. J. C,* 46, (2006) 107-111

[3] The most advanced LENR project utilizing nickel and copper.
Y. Iwamura, T. Itoh, J. Kasagi, S. Murakami and M. Saito, Progress in Energy Generation Research using Nano-Metal with Hydrogen/Deuterium Gas, *J. Condensed Matter Nucl. Sci.* 23 (2022) 1-17

[4] Phenanthrene, which possesses a molecular structure similar to that of graphene, generates excess heat.
T. Mizuno, Heat and Radiation Generation during Hydrogeneration of CH Compound, *J. Environmental Science and Engineering,* 5 (2011) 453-459

[5] The results of the experimental study using THz radiation suggest the presence of excess heat in LENR.
Letts, Dennis., Highly Reproducible LENR Experiments Using Dual Laser Stimulation, *Current Science* 108, no.4 (2015) 559-561

Appendix 2: Low-Energy Nuclear Battery (LENB) - LENR as a battery

In Appendix 2, we explore the potential of using LENR as a source of power for batteries. Rather than optimizing the nano sandwich solely for generating heat, we propose a new design that takes advantage of LENR to provide sustainable energy storage solutions. Our approach involves integrating the LENR reaction into a battery system, which could potentially offer higher efficiency and longer lifetimes compared to traditional battery technologies.
To fulfill the requirement of an efficient, stable, and safe battery, we propose using stacks of graphene sheets with its occluded hydrogen. It can serve as a negative electrode on its own, but we insert p-ne junction plates (such as GaN) into the stacks of graphene sheets to generate an electrical current through an electron-beam-induced effect. We propose exposing the graphene sheets to both infrared light and THz waves, which will stimulate the plasmons present on the graphene surface, as shown in Figure 4. These novel approaches aim to enhance the overall efficiency, stability and safety of LENB.

In previous Appendix, we explored the fusion reaction between hydrogen and Nickel in graphene. When this occurs, the initial result is a rise in beta decay energy. Our approach here is to avoid introducing additional materials that could convert the beta decay into heat. Instead, we focus on the heat absorption by graphene, which then contributes to the formation of plasmon while also promoting the fusion of hydrogen ion into carbon nucleus. This process allows us to manipulate the behaver of hydrogen, enabling us to control its properties through graphene. As the result, we can harness electricity directly with high efficiency and stability, without the need for heat exchange. We can achieve this through the use of static nano structure composed of graphene.

Figure 4. The nano sandwich - LENB version