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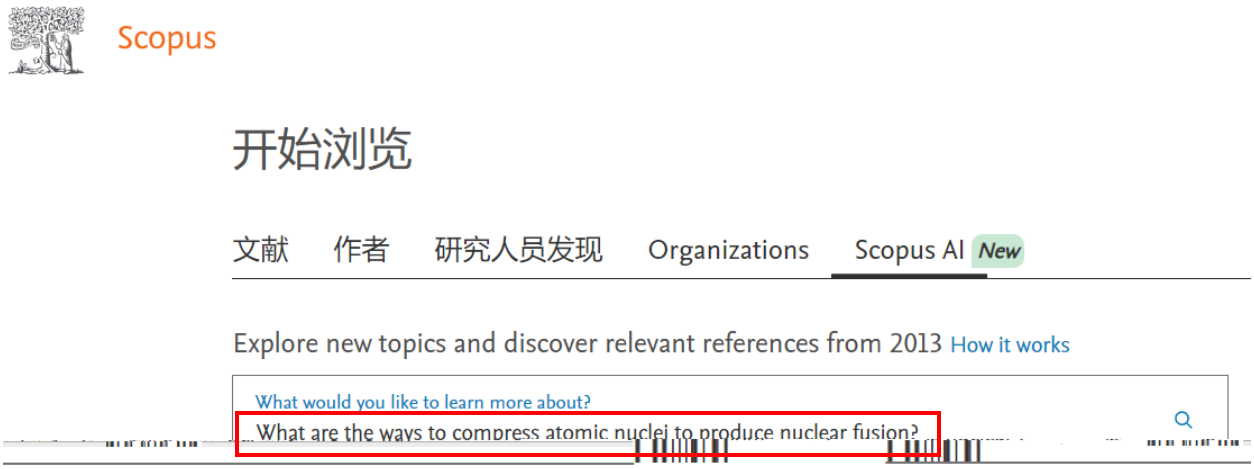
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What are the ways to compress atomic nuclei to produce nuclear fusion?

What are the ways to compress atomic nuclei to produce nuclear fusion?

Summary

Based on the query about compressing atomic nuclei to produce nuclear fusion, the following insights can be derived from the provided abstracts:

Ways to Compress Atomic Nuclei for Nuclear Fusion:

- **Room Temperature Fusion Technique:** One technique involves compressing a powder mixture of deuteride and catalytic material to achieve nuclear fusion at room temperature, resulting in an explosive reaction beyond known chemical processes [1].

- **Fusion Reactions:** The most efficient fusion reaction involves merging hydrogen isotopes deuterium and tritium, to produce helium and a neutron, releasing 17.6 MeV of kinetic energy [2].

[illegible] including the use of stable beams, radioactive beams, and symmetric fusion reactions. Stable beams are predicted to be the most favorable method for producing superheavy nuclei due to their higher intensities [3] [4] [5].

[illegible] these factors significantly influence the success of fusion reactions [5] [6].

- **Fusion of Exotic Nuclei:** Reactions such as fragmentation of heavy ions, direct reactions (e.g., (p, d), (d, p)), fission, and deep-inelastic transfer are used for the synthesis of exotic nuclei near the boundaries of stability [7].

Given the information from the abstracts, it is evident that various methods, including room temperature fusion techniques, stable beams, and specific fusion reactions, are proposed for compressing atomic nuclei to produce nuclear fusion. However, the direct compression of atomic nuclei is not explicitly discussed in the provided abstracts. Therefore, while the abstracts provide insights into different fusion methods and challenges, they do not directly address the specific ways to compress atomic nuclei for nuclear fusion.

References

1 A technique for making nuclear fusion in solids
Wayte R.
Journal of Condensed Matter Nuclear Science ↗ 2016

2 Challenges on the road towards fusion electricity
Donné T.
Europhysics News ↗ 2016

3 Possibilities for synthesis of new isotopes of [illegible]
Bao X.J., Cao Y., Li J.Q., Zhang [illegible]
Physical Review C ↗ 2016

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386 citations

[illegible]

199 citations
Isotopic dependence of fusion cross sections in reactions with heavy nuclei
G.G. Adamian, Gurgen G., N.V. Antonenko, Nikolai V. [illegible]
W. Scheid, Werner [illegible]
Nuclear Physics, Section A ↗ 2000

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Expanded summary

Based on the user's query, I will address the theoretical methods and experimental techniques for

potential applications of compressed atomic nuclei in nuclear fusion research.

Theoretical Methods for Compressing Atomic Nuclei for Nuclear Fusion:

- The most efficient fusion reaction involves merging Deuterium and Tritium isotopes in
- The book encompasses both magnetic and inertial confinements, as well as exotic mec
- The exchange Coulomb energy of charged particles paired in orthoboson has the chara

leading to nuclear reactions without a Coulomb barrier, explaining the feasibility of low

reactions [3].

Experimental Techniques for Compressing Atomic Nuclei fo

- A technique for making nuclear fusion at room temperature
- Experiments using a pulsed power facility induced collective

Challenges and Limitations of Compressing Atomic Nuclei for Nuclear Fusion

The synthesis of exotic nuclei near the boundaries of stability presents complicated problems in experimental nuclear physics, with special requirements for the choice of reactions and methods of transportation and registration due to their short lifetime and low binding energy [6].

Recent assessments of the strategic prospects of the nuclear energy industry suggest that the development of technological, materials science, environmental, and economic problems in the full-scale de

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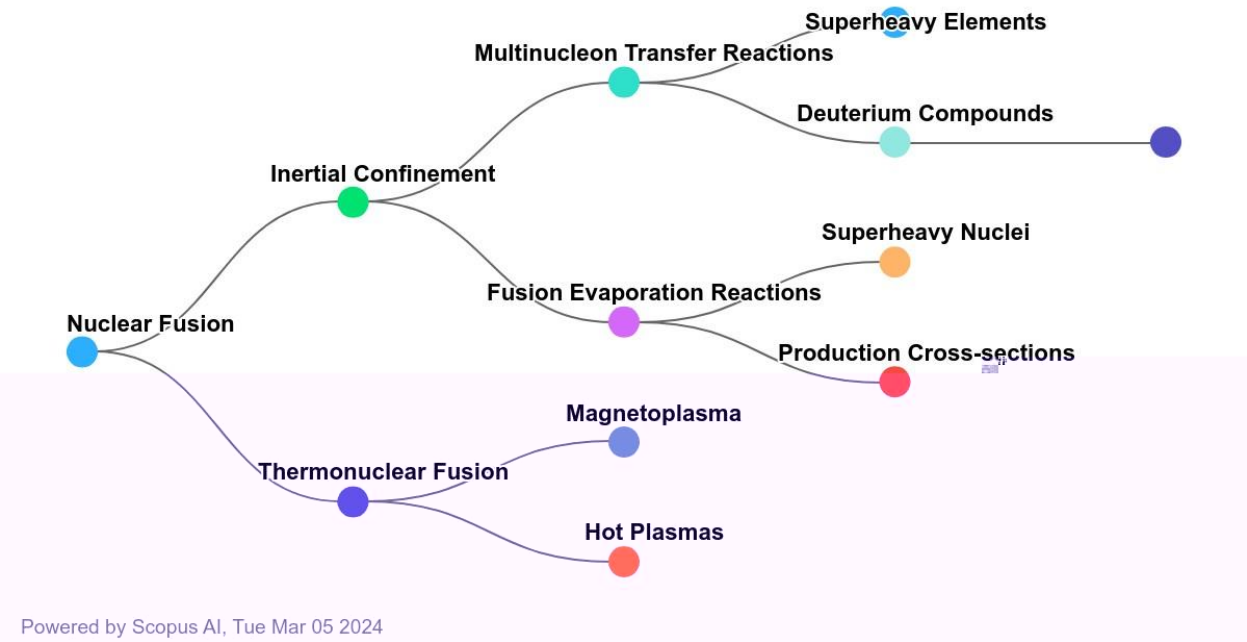

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Nuclear ground-state masses and deformations

P.M., Möller, Peter, Nix, James Rayford, W.D., Myers, W.J., Swiatecki, Wladys

Atomic Data and Nuclear Data Tables 1995

199 citations

ıs in reactions

Isotopic dependence of fusion cross sectior with heavy nuclei

kolai V.,

G.G., Adamian, Gurgen G., N.V., Antonenko, Ni W., Scheid, Werner

Nuclear Physics, Section A 2000

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Topic experts

Clynes, Tom T.

28 citations **1** matching documents **2** h-index

Tom T. Clynes is an expert in nuclear fusion as evidenced by their publication on a new Z-pinch reactor, which demonstrates a simpler approach to achieving nuclear fusion. Their research and publication indicate [illegible] in the field of nuclear fusion [illegible] deep understanding of the challenges and innovative approaches

Preview profile

Don, Mewantha Aurelio Kaluthantrige M.A.K.

[illegible] citations [illegible]

trated expertise in the realm of nuclear fusion with their ı. This indicates a focus on exploring advanced propulsion ment in cutting-edge fusion research.

Mewantha Aurelio Kaluthantrige Don has demonst recent publication on interstellar fusion propulsior methods, showcasing their knowledge and involve

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Go deeper

- How can magnetic confinement be used to compress atomic nuclei for nuclear fusion?
- What role does laser compression play in achieving nuclear fusion?
- What are the challenges in compressing atomic nuclei using inertial confinement?

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