

## Investigation of the Conditions for the Formation of Particle Fluxes and High-Power Radiation in a Plasma with a Strong Magnetic Field

*Friday, 15 July 2022 17:50 (20 minutes)*

Due to the high-energy particles of thermonuclear reactions, the generation of neutron and X-ray radiation is possible, nuclear fusion reactions can occur, in which particles of even higher energies are born (for example, protons with an energy of 14 MeV), the use of which is possible in a number of applied technologies for medicine, safety and disposal nuclear waste.

Plasma maintenance in a highly nonequilibrium state requires a very powerful driver (heating energy source), and therefore one should not count on the fact that such a plasma will provide an energy output that greatly exceeds the driver energy. However, it should be emphasized that the conversion of the energy of the driver into the energy of beams and radiation from the plasma has a very high efficiency compared, for example, with classical accelerator systems. Also, such a plasma that generates neutrons of the megaelectronvolt range can itself be a driver of a subcritical nuclear system, in which (in the chains of transformations triggered by these neutrons) nuclear fuel is produced and waste from the nuclear fuel cycle is simultaneously disposed of. Such a symbiotic "fusion-fission" system achieves a multiple increase in energy output.

### The speaker is a student or young scientist

Yes

### Section

1. Synchrotron and neutron radiation sources and their use in scientific and applied fields

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**Session Classification:** Applications of nuclear methods in science and technology