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Controlled Channeling of Atom Electrons and Accompanying Nuclear Processes During the Orientational Action of a Polarized Laser Pulse on a Crystal

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The work investigated the features of the formation and movement of a superdense flow of fast electrons, formed under the action of a polarized high-power laser pulse on the crystal surface, inside a crystal. It is shown that, at a certain orientation of the laser pulse, repeatedly planar channeling of these electrons occurs, with their energy reaching relativistic values.

The report also discusses the features of the interaction of periodically channeled electrons with crystal atoms and nuclei, including the excitation of nuclei, the creation of inversion of internal atom X-Ray states, and the process of inverse beta-decay of crystal nuclei.

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