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HIGH-FOCUS PROPERTY OF COSMIC RELIC NEUTRINOS SCATTERED BY ULTRA-RELATIVISTIC ELECTRONS

Abstract

We investigate the scattering of cosmic relic neutrinos by transversely polarized ultra-relativistic electrons accelerated up to energies of several hundred GeV and passing through the single crystal possessing a sufficiently strong internal electrostatic field. We calculate the average angle of the scattering of the neutrinos in the final state. When the ultra-relativistic electrons pass through a single crystal possessing a strong internal electrostatic field (eg, tungsten, diamond) along its crystal axis or plane, the passing electrons experience the action of an extended effective magnetic field, the strength of this magnetic field by orders of magnitude exceeds that of any permanent magnets. In this case, the influence of the observed effective magnetic field on the scattering of relic neutrinos by the accelerated electrons passing through the single crystal is essential. The calculations show that the neutrinos in the final state (whose energy is amplified essentially) scatter at extremely small angles with respect to the plane perpendicular to the effective magnetic field direction. It means that the scattered high-energy neutrinos are highly focused within the extremely small angle. The strong focus property of the scattered high-energy neutrinos enables us to direct them to the desired distant object located at the given coordinates and to transmit energy and information to that object by means of these neutrinos.