

Abstract Submitted
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Enhanced tunneling in a magnetic field BORIS IVLEV — As known, a probability of quantum tunneling through a static potential barrier $U(x)$ can be substantially reduced by a static magnetic field H_z . This happens due to increase of the effective barrier height caused by Landau's gauge potential in a magnetic field (the same potential results in Landau levels). There is an exponentially small current in the direction of tunneling, x . An underbarrier current in the direction perpendicular to tunneling, y , is not small. If the potential barrier $U(x, y)$ depends also on the coordinate y , a new unexpected scenario can occur. Now the partial de Broglie waves, generated under the barrier, are not collected to the current in the y direction only but can be reflected by the potential $U(x, y)$. An interference of those underbarrier waves after reflections can result in a peak of the particle density at a classically allowed region close to the conventional exit point from under the barrier. At the certain magnetic field, $H_z = H_R$, the peak amplitude is not exponentially small (Euclidean resonance). The same phenomenon can occur in tunneling through nonstationary barriers and is expected for photon tunneling when a refractive index is slightly inhomogeneous in the tunnel region.

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