

Some Properties of Density Matrix in Physics of Interaction of Particle with a Condensed Matter

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Abstract

The density matrix (DM) is a function on seven variables – six space and one time variable and therefore it contains a much more information about the particle's wave field (PWF) in comparison with the wave function. We can be of meaning that all this additional information which contains in DM isn't important and may be omitted in explanations of all the physical effects. But this point of view cannot be accepted because the DM is the simplest possibility to describe the properties of the PWF. We should keep in mind that the projectile which interacted with the environment don't be described by the wave function – its wave function isn't exists. This circumstance forces us to give a physical meaning to all the properties of DM. The change in the size of PWF in interaction with the the solid is analyzed. The creation of resonance states of projectile during the time of flight across the solid film as well as the explanation of breaking of the PWF during the interaction are found.



Biography:

Gennadiy Filippov has his expertise in particle-solid interaction physics. He has completed his Doctor of Physics Dissertation at the age of 54 years from Tomsk State University, Tomsk (Russian Federation). Undergraduate Institution: Moscow State University, Physical Faculty. Moscow, Russian Federation. Date of graduation: January 1961. Physicist. Now he is Professor in Dept. of Gen. and Theor. Phys. in the Chuvash State Pedagogical University in Cheboksary, Russian Federation

Speaker Publications:

1. Filippov, Gennadiy & Aleksandrov, V. & Stepanov, A. (2019). Study of Resonance Phenomena During Thin-Film Perforation upon the Passage of Multicharged Ions. Journal of Surface Investigation: X-ray, 10.1134/S1027451019060302. Synchrotron and Neutron Techniques. 13.1280-1283.

2. Filippov, Gennadiy & Aleksandrov, V. & Lysova, Irina & Stepanov, A.. (2019). Propagation of Waves and Particles Through Porous Structures (I). Journal of Surface Investigation: X-ray, Synchrotron and Neutron Techniques. 13.635-639. 10.1134/S1027451019040062.
3. Maksyuta, N. & Vysotskii, Vladimir & Efimenko, S. & Sabirov, A. & Filippov, Gennadiy & Lysova, Irina. (2019). Evolution of the Spatial Distribution of Hydrogen Atoms Channeling along Non-Chiral Carbon Nanotubes. Journal of Surface Investigation: X-ray, Synchrotron and Neutron Techniques. 13. 542-547. 10.1134/S1027451019020320.
4. Filippov, Gennadiy. (2018). Density matrix in description of the collision of atomic particle with solid film.. Materials Science and Nanotechnology. 02. 10.35841/nanotechnology.2.1.15-16.
5. Aleksandrov, V. & Filippov, Gennadiy. (2012). Estimating the ionization time of a hydrogen atom during its motion in a carbon nanotube. Bulletin of the Russian Academy of Sciences: Physics. 76. 10.3103/S1062873812060068



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