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Relativistic Tunneling in the Light Front

In a recent work\cite{Sales} we demonstrated an interesting result about the properties of tunneling time in the light front with the help of phase time. The question we may pose is: What do we understand as a tunneling time? Since the quantum system goes across a region within the potential that is forbidden in classical physics, we are interested in knowing how long this system takes to do this.

The fundamental reason for the existence of so intriguing aspects in the study of tunneling time is found in the fact that time is not an observable in Quantum Mechanics, as pointed out long ago by Pauli\cite{Pauli}. Due to this, there are several definitions for the tunelling time, which, in their majority, are not equivalent among themselves\cite{Winful}.

Here we show these "temporal" aspects in the tunneling via Klein-Gordon equation in the light front. With this, we find the Hartman effect in the light front.

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\thebibliography{9}

\bibitem{Sales} Sales, Jorge Henrique ; Suzuki, Alfredo T. ; Santos, G. S. Few-Body
Systems, p. 1-6, (2015).

\bibitem{Pauli} Pauli, W., {\em General Principles of Quantum Mechanics}, Springer, Heidelberg
(1980).

\bibitem{Winful} Winful, H. G., {\em Tunneling time, the Hartman effect, and superluminality: A
proposed resolution of an old paradox}, Phys. Rep. 436 1-69 (2006).

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