Dynamic Localization of Particle Moving in Solid Film GEN-
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open university — Calculation of the density matrix (DM) for a projectile during
the passage through a solid film have shown progressive diminishing of the projec-
tile's coherence length. For to find a more detail information about the projectile we
perform a famous von Newmann's decomposition of DM on "pure" states and find
an ambiguity of this approach. The unambiguous decomposition can be obtained
if we introduce an additional coherence criterion: each term of the decomposition
should conserve the shape of function of coherence. We use the next arguments: i)
the function of coherence could be measured; ii) the parts of a wave field found in
relation of mutual coherence belong to one particle and couldn't be separated from
the particle; iii) the parts of a wave field which dont find in relation of mutual coher-
ence are belong to different particles and couldn't be associated with one particle.
With the help of this approach one can find that during the penetration in a film the
projectile undergo a significant spatial localization. The localized quasi-stationary
state of projectile could conserve the information about the past interaction with
environment.

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