Non-local Effects on the Heavy-Ion Fusion at Sub-Barrier Energies

http://www.firstlight.cn 2007-09-30

We investigate the effect of Pauli non-locality in the heavy-ion optical potential on sub-barrier fusion reactions.The S˜ao Paulo potential, which takes into account the Pauli non-locality and has been widely used in analyzing elastic scattering, has also recently been applied to heavy-ion fusion. However, the approximation employed in deriving the S˜ao Paulo potential, based on the Perey-Buck semi-classical treatment of neutron induced

reactions, must be assessed for charged particles tunneling through a barrier. It is the purpose of this note to look into this question. We consider the widely studied system 16O + 208Pb at energies that span the barrier region from 10 MeV below to 10 MeV above. It seems that the non-locality plays a minor role. We find the S˜ao Paulo potential to be quite adequate throughout the region.

存档文本