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Confining the single particle potential parameters in direct nuclear reactions with radii of nucleon density distributions

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For a nucleus, B, which can be modeled as composed of a core nucleus A and a valence particle x (B = A + x), we derived the relation between the root mean square (rms) radius of the single particle wave function of x in B and the rms radii of nucleon density distributions of B, A and x. This relation allows one to determine the radii parameters of the single particle potentials (SPPs), which are usually not well confined in direct nuclear reaction calculations, with the radii of nucleon density distributions of atomic nuclei, and puts the resulting parameters on a sound physical ground.

Field of your work

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