

Abstract Submitted
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Finite Range Effects in Knockout Reactions¹ BHUSHAN N. JOSHI,
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JAIN COLLABORATION — Finite Range DWIA calculations have been performed
for the first time. For the $(\alpha, 2\alpha)$ reactions, the calculations have indicated extreme
sensitivity to the short range component of the t-matrix effective interaction. The
vagaries of the energy dependent α -spectroscopic factors, have been understood
using well established nuclear data. Using repulsive core $\alpha - \alpha$ interaction two
order of magnitude enhancement is explained. FR-DWIA calculation is a new tool
to investigate the nature of nuclear potential. Heavy cluster knockout reaction
such as $^{16}\text{O}(^{12}\text{C}, 2^{12}\text{C})^4\text{He}$ has been performed for the first time indicating an order
of magnitude enhancement compared to the $(\alpha, 2\alpha)$ results. The (C,2C) results
support a short range repulsive core C-C potential. Similar study can be made
to probe the short range behavior of $p - p$, $\pi - p$ and K^+n systems to study the
dibaryons, delta resonances and the pentaquarks. A new field of Heavy Cluster
Knockout Reaction is opened up to study the core knockout of Halo nuclei. Our
FR-DWIA formalism has applications in Atomic and Molecular Physics and neutron
multiplication calculations for ADS also.

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