Relation between ρ, ρ_a & $S(\rho)$
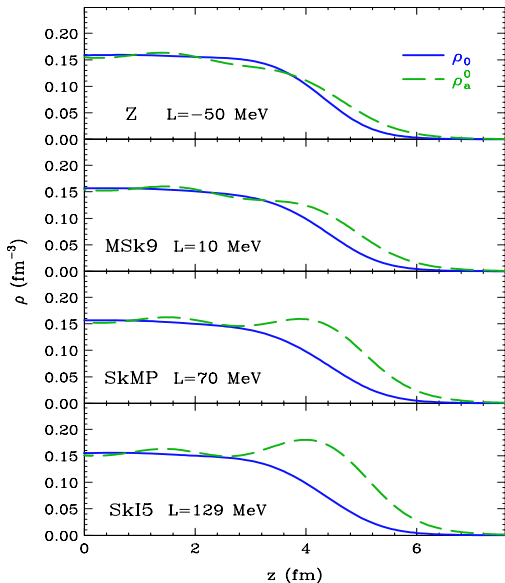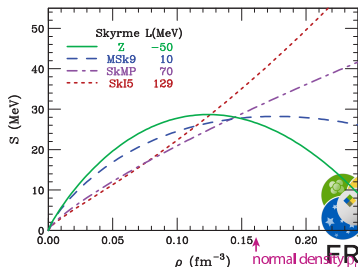

Results f/different Skyrme
ints in half-∞ matter
PD&Lee NPA818(09)36
Isoscalar ($\rho = \rho_n + \rho_p$; blue) &
isovector ($\rho_a \propto \rho_n - \rho_p$; green)
densities displaced
relative to each other.

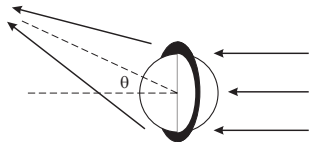As $S(\rho)$ changes, $\rho_a(r) \propto \frac{\rho(r)}{S(\rho(r))}$,
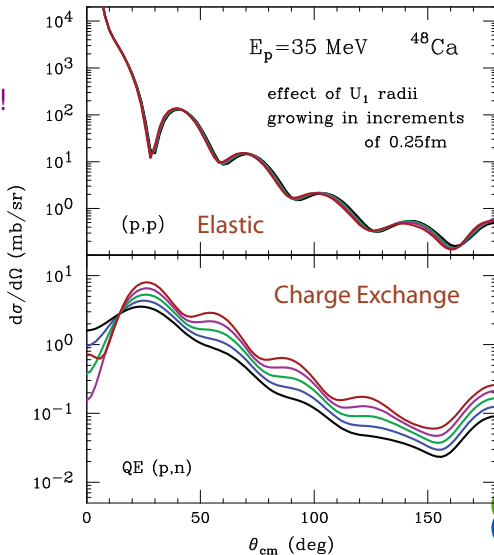so does displacement.

Cross-Section Sensitivity to Isovector Skin

Koning-Delaroche
NPA713(03)231
same radii R for U_0 & U_1!

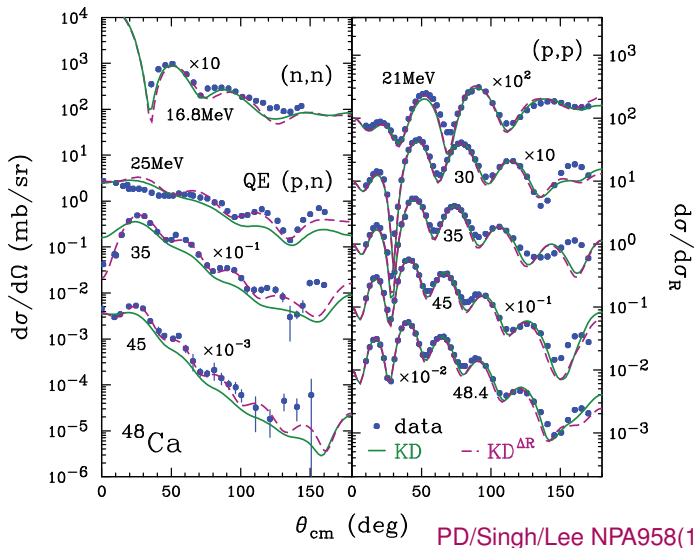$$U_1(r) \propto \frac{U_{01}}{1 + \exp \frac{r-R}{a}}$$

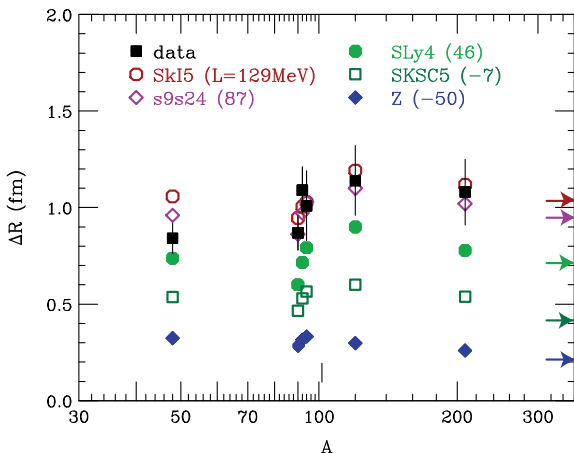$R \to R + \Delta R_1$

charge-exchange cs
oscillations grow

$E_p = 35$ MeV ^{48}Ca

effect of U_1 radii
growing in increments
of 0.25fm

(p,p)   Elastic

Charge Exchange

QE (p,n)

$d\sigma/d\Omega$ (mb/sr)

θ_{cm} (deg)

FRIB

Simultaneous Fits to Elastic & Charge-Change: ^{48}Ca

Different radii for densities/potentials: $R_a = R + \Delta R$

FRIB

Thickness of Isovector Skin

6 targets analyzed, differential cross section + analyzing power

Colored: Skyrme predictions. Arrows: half-infinite matter

Thick ∼ 0.9 fm isovector skin!   ∼Independent of A...

FRIB