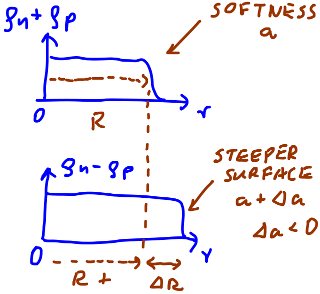
SCHEME:

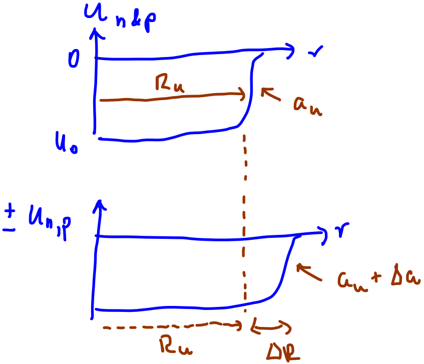
$L \quad a^{V}_{sym}$ $\xleftrightarrow{\text{DFT}}$

↑

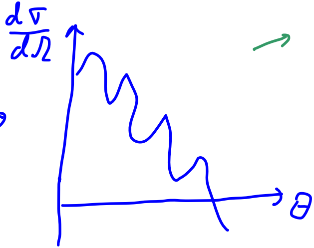
200 DFT PARAMETER SETS

STRUCTURE CALCULATION





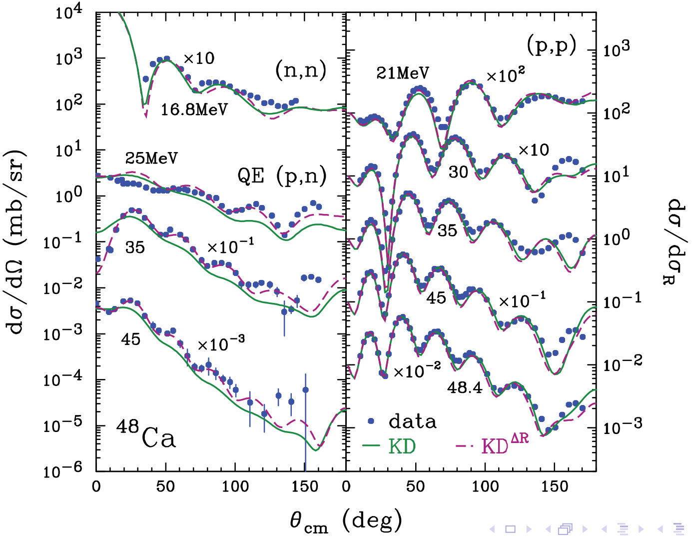
→



→ ΔR Δa $L \quad \check{a}_{sym}$

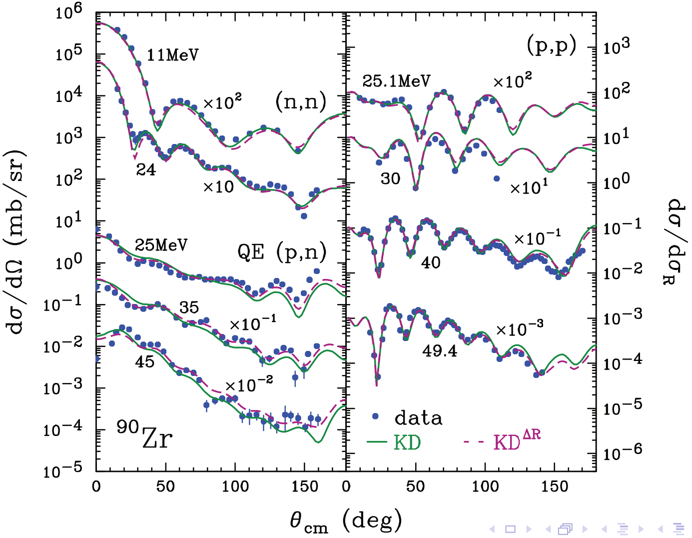
Modified Koning-Delaroche Fits: ^{48}Ca

In Koning-Delaroche: $R_{0,1} = R + \Delta R_{0,1}$ $\quad a_{0,1} = a + \Delta a_{0,1}$



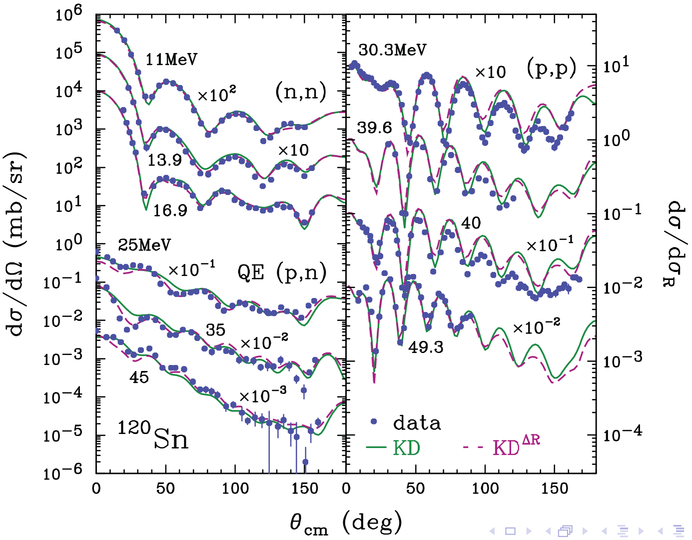
Modified Koning-Delaroche Fits: ^{90}Zr

In Koning-Delaroche: $R_{0,1} = R + \Delta R_{0,1}$ $a_{0,1} = a + \Delta a_{0,1}$



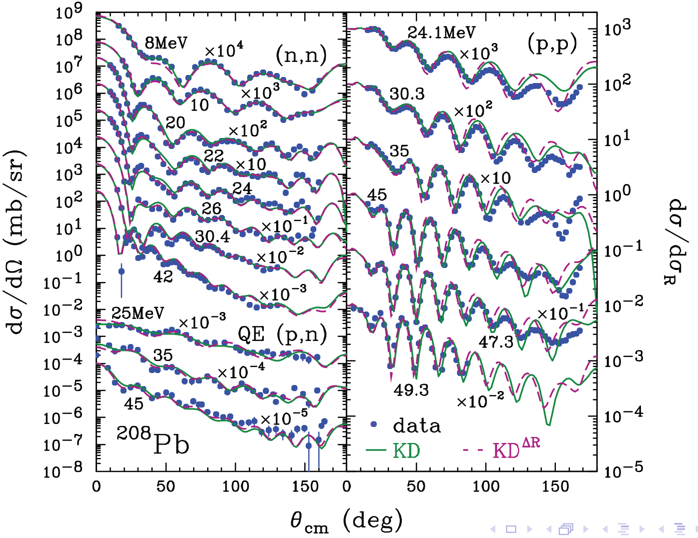
Modified Koning-Delaroche Fits: ^{120}Sn

In Koning-Delaroche: $R_{0,1} = R + \Delta R_{0,1}$ $a_{0,1} = a + \Delta a_{0,1}$

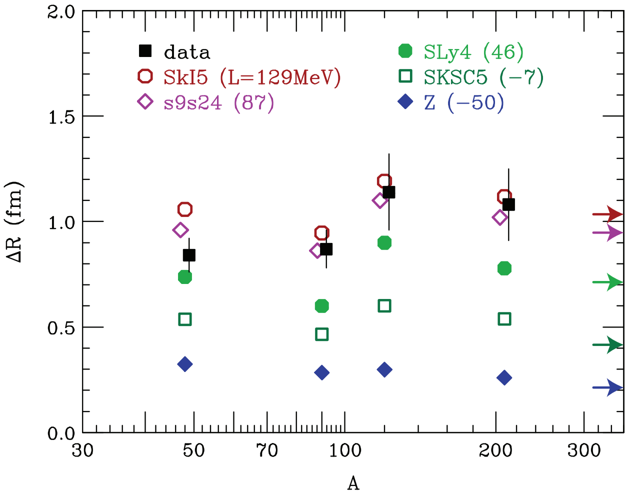


Modified Koning-Delaroche Fits: ^{208}Pb

In Koning-Delaroche: $R_{0,1} = R + \Delta R_{0,1}$ $\quad a_{0,1} = a + \Delta a_{0,1}$



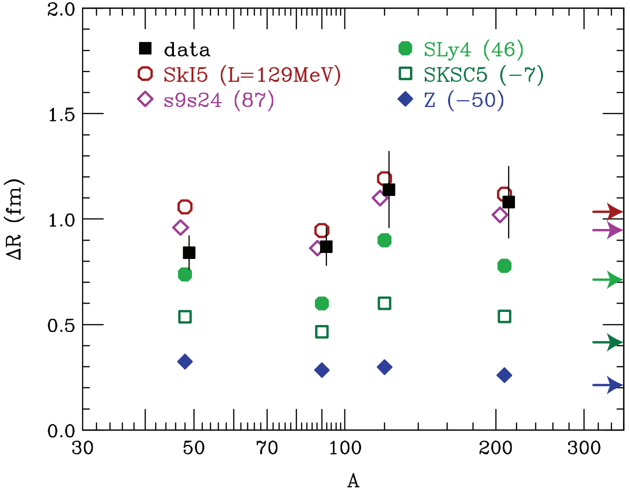
Size of Isovector Skin



Colored: Skyrme predictions. Arrows: half-infinite matter

Large ~ 0.9 fm skins! ~Independent of *A*...

Size of Isovector Skin



Colored: Skyrme predictions. Arrows: half-infinite matter

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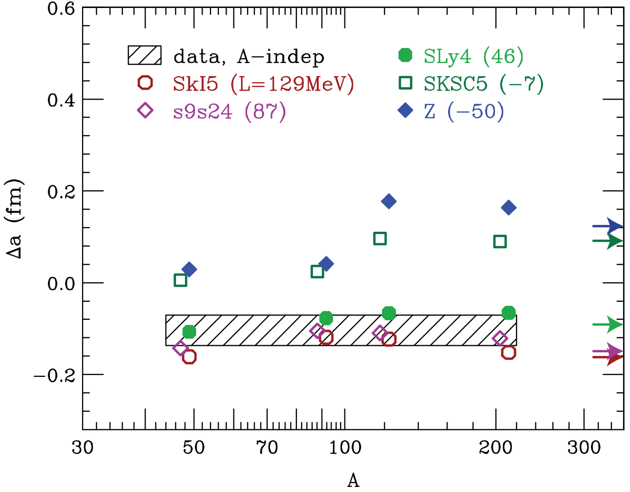
Difference in Surface Diffuseness



Colored: Skyrme predictions. Arrows: half-infinite matter

Sharper isovector surface than isoscalar!

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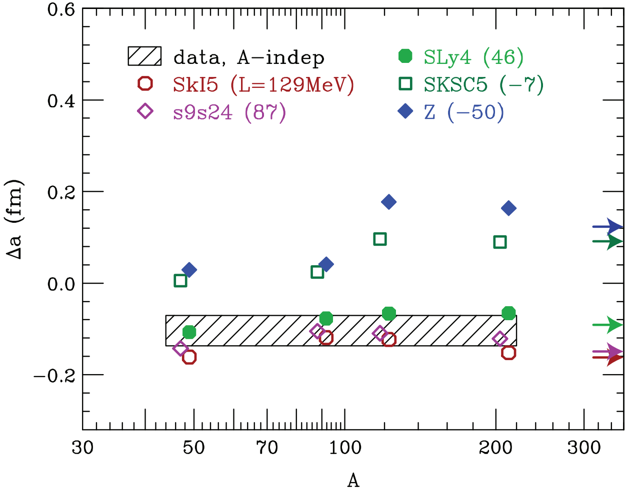

Colored: Skyrme predictions. Arrows: half-infinite matter

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Bayesian Inference

Probability density in parameter space $p(x)$ updated as experimental data on observables E, value $\overline{E}$ with error σ_E, get incorporated

Probability p is updated iteratively, starting with prior p_{prior}

$p(a|b)$ - conditional probability

$$p(x|\overline{E}) \propto p_{\text{prior}}(x) \int \mathrm{d}E \, e^{-\frac{(E-\overline{E})^2}{2\sigma_E^2}} \, p(E|x)$$

For large number of incorporated data, p becomes independent of p_{prior}

In here, p_{prior} and $p(E|x)$ are constructed from all Skyrme ints in literature, and their linear interpolations. p_{prior} is made uniform in plane of symmetry-energy parameters (L, a_a^V)

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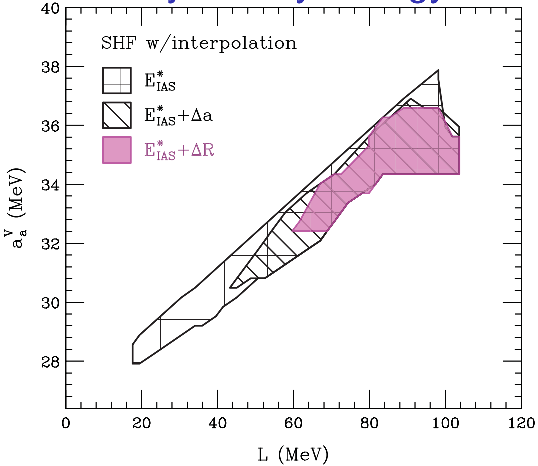
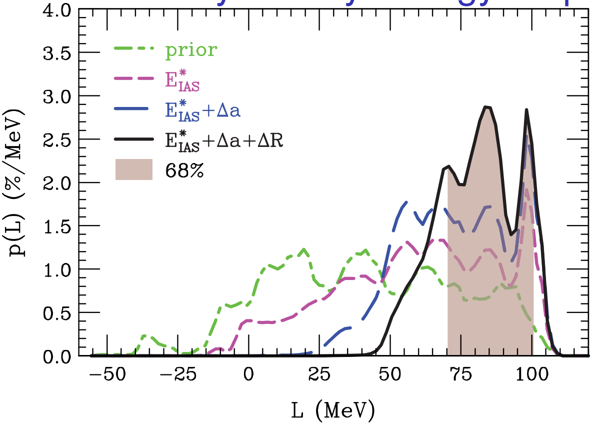
Constraints on Symmetry-Energy Parameters



68% contours for probability density

$E^*_{\rm IAS}$ - from excitations to isobaric analog states in PD&Lee NPA922(14)1

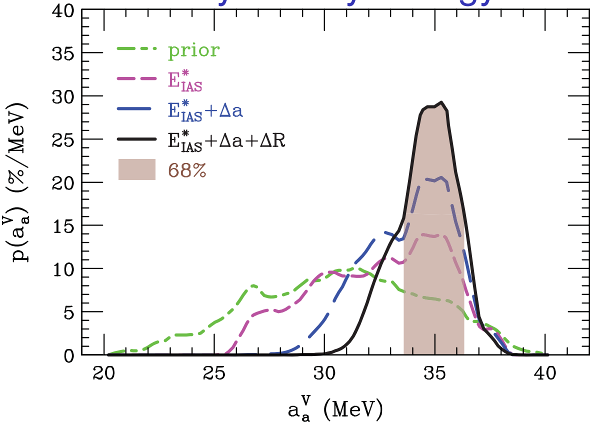
Likelihood f/Symmetry-Energy Slope



E^*_{IAS} - from excitations to isobaric analog states in PD&Lee NPA922(14)1

Oscillations in prior of no significance
- represent availability of Skyrme parametrizations

Likelihood f/Symmetry-Energy Value



E^*_{IAS} - from excitations to isobaric analog states in PD&Lee NPA922(14)1

Oscillations in prior of no significance - represent availability of Skyrme parametrizations