

Deuteron electro-disintegration

Current status and future

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Bound states and resonances in Effective Field Theories and Lattice QCD calculations
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Motivation

Chiral potentials are fitted to δ , and the order by order improvement (w.r.t. δ_{Nij}) seems quite o.k. in $600 < \Lambda < 1000$ MeV.

One way to see whether the PC is correct is to apply it to the calculation of other observables, e.g., $d(e, e'N)$.



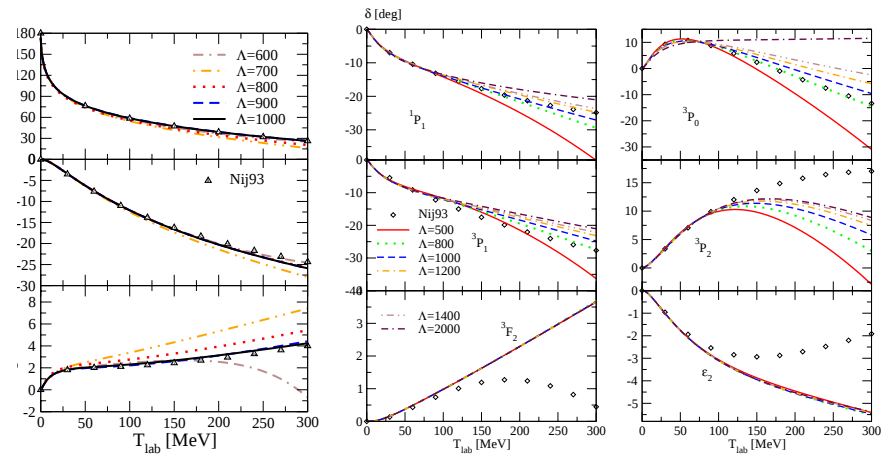
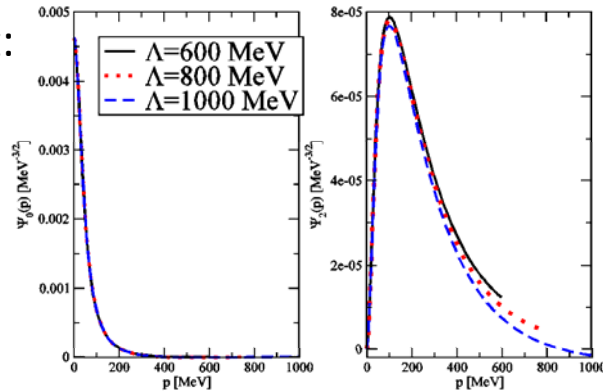
Look at longitudinal response function f_L (up to $O(eP^3)$).
Input: Only WFs & T-matrix (from NNLO χ PT), p & n form factor.
See whether Λ -dep. in NN $\approx \Lambda$ -dep. in f_L



If not, then

1. PC in NN sector is wrong.
2. PC in the process is wrong.
3. Both.

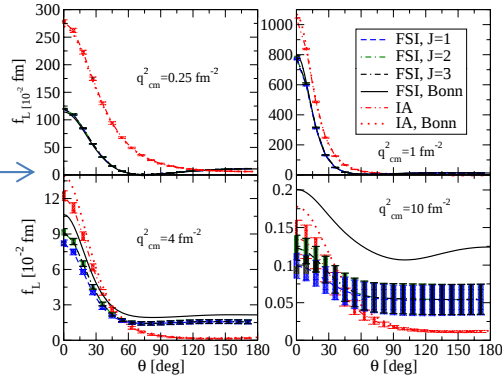
Λ -dep. in input:
(very small)



In general

Λ -dep. in f_L :
(dep. on K.E.)

$E_{np}=10$ MeV $\rightarrow$



Λ -dep. $\leq 10\%$ for $|q_{cm}^2 - q_{qf}^2| \leq 4 \text{ fm}^{-2}$, $E_{np} \leq 60 \text{ MeV}$.

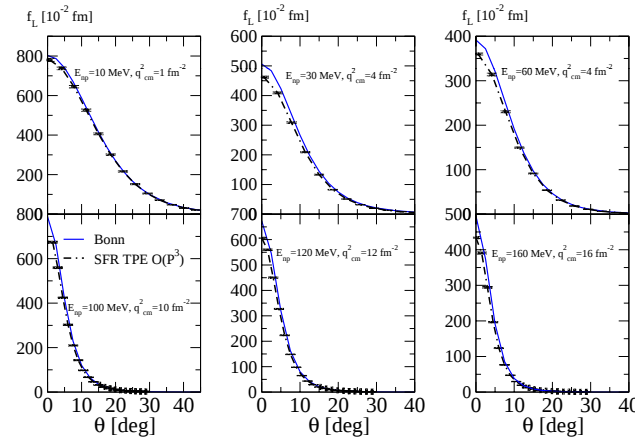
(A little bit more restricted if compare w.r.t. exp. data)

$\Rightarrow \Lambda$ -dep. in $d(e,e'N) \gg \Lambda$ -dep. in NN.

(Reason: Away from q.f. peak, FSI become important,
and Λ -dep. in $T_{\text{off-shell}}(k,p;E)$ got magnified.)



Around quasi-free peak



Agree with Bonn results and exp. data

to surprising high ($E_{np}=160$ [MeV], $q_{cm}^2=16$ [fm^{-2}]).



Future:

Different counting needed for different K.E.
region. The usual PC (based on naïve variables:
 $|p'|, |q|$) may need to be modified.