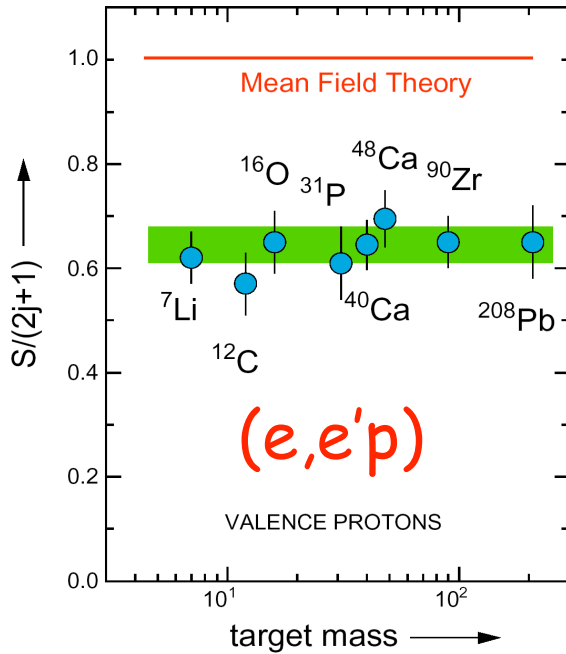
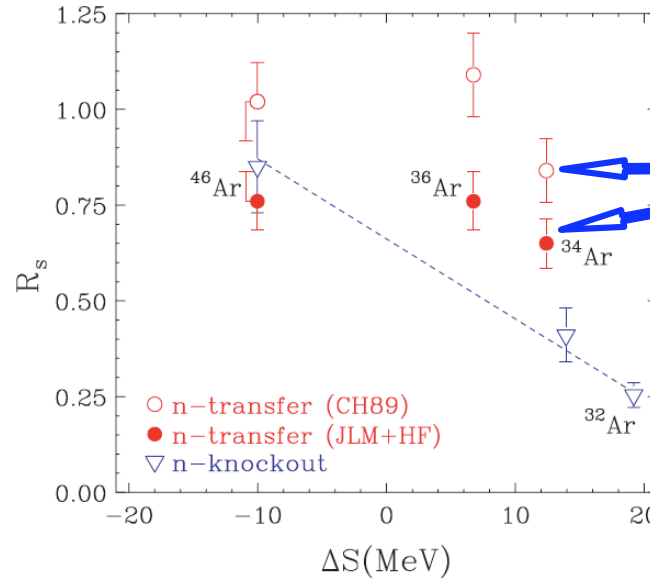


Linking nuclear reactions and nuclear structure

Correlations from nuclear reactions

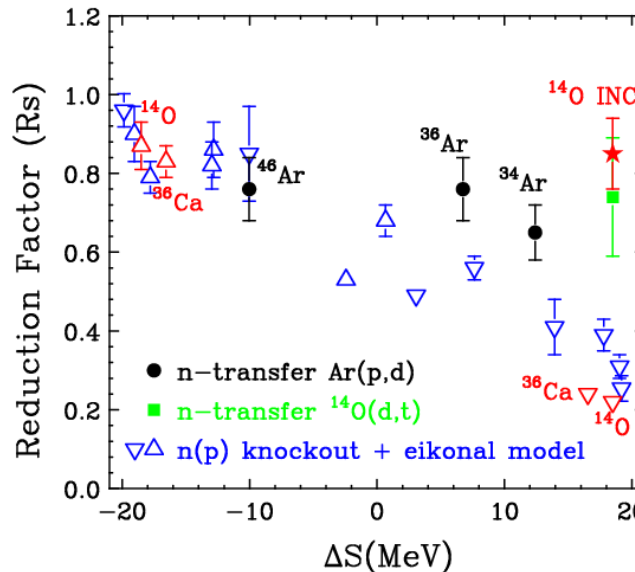


In (e,e'p) proton still has to get out of the nucleus
 → optical potential
 Nucl. Phys. A553,297c (1993)



Different optical potentials → different reduction factors for transfer reactions
 Spectroscopic factors > 1 ???

PRL 93, 042501 (2004) HI
 PRL 104, 112701 (2010) Transfer

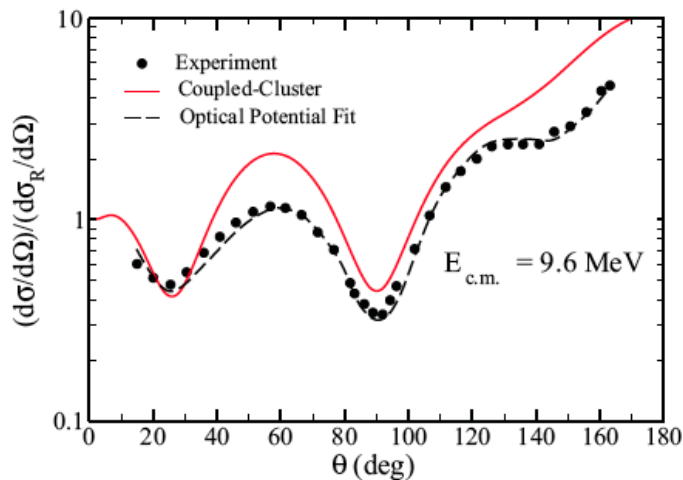


Recent summary

Different reactions different results???

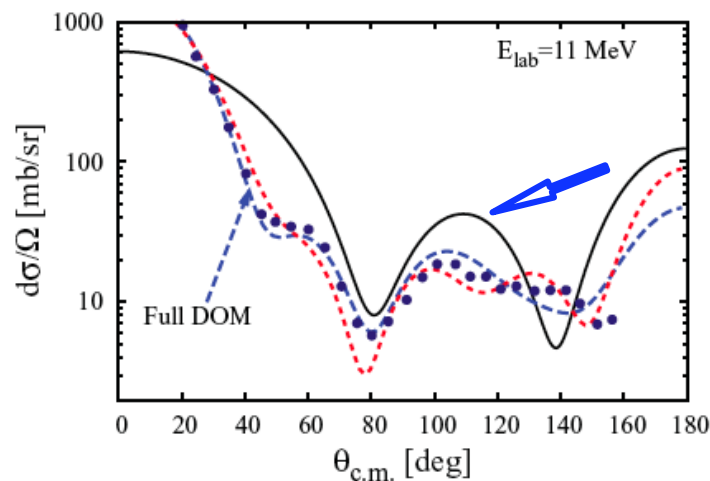
Linking nuclear reactions and nuclear structure

- Extracting information on correlations beyond the independent particle model requires **optical potentials** in (e,e'p), (d,p),(p,d),(p,pN), etc.
- Quality of **ab initio** to describe elastic scattering or optical potentials should be improved substantially and **urgently**



^{40}Ca

Coupled cluster calculation using overlap functions
PRC86,021602(R)(2012)
Probably limited to low energy

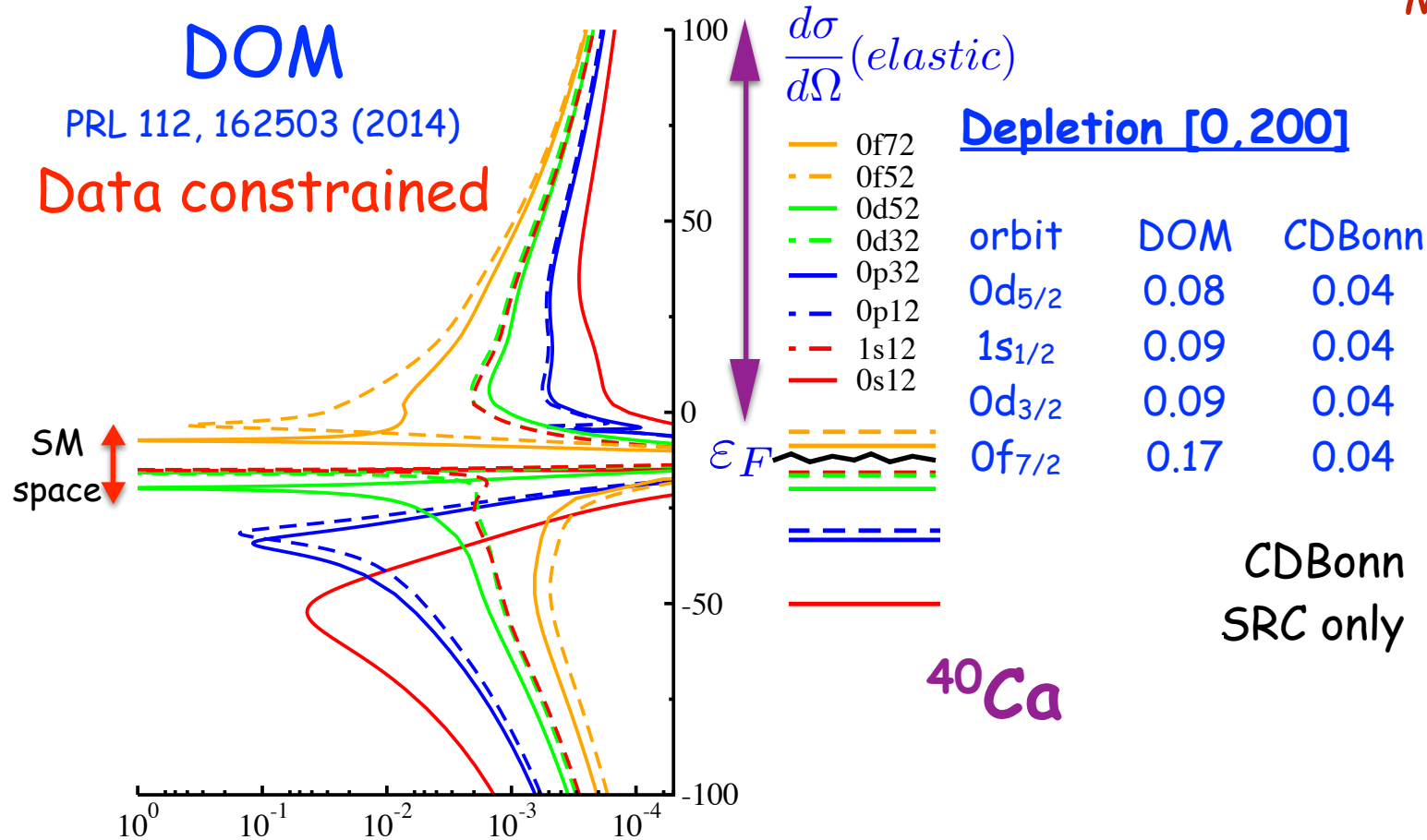


Green's function result \rightarrow optical potential with emphasis on SRC only
PRC84,044319(2011)

Linking nuclear reactions and nuclear structure

Dispersive optical model (DOM) → real nucleus

Spectral function for bound orbits



Main physics:

- surface (LRC)

- continuum

- non-locality

- energy scale

- SRC

- "high" k

- moderate depletion

- ^{40}Ca : some aspects not too different from exotic nuclei

Future: Consider the complete picture and analyze nuclear reactions with causal non-local potentials