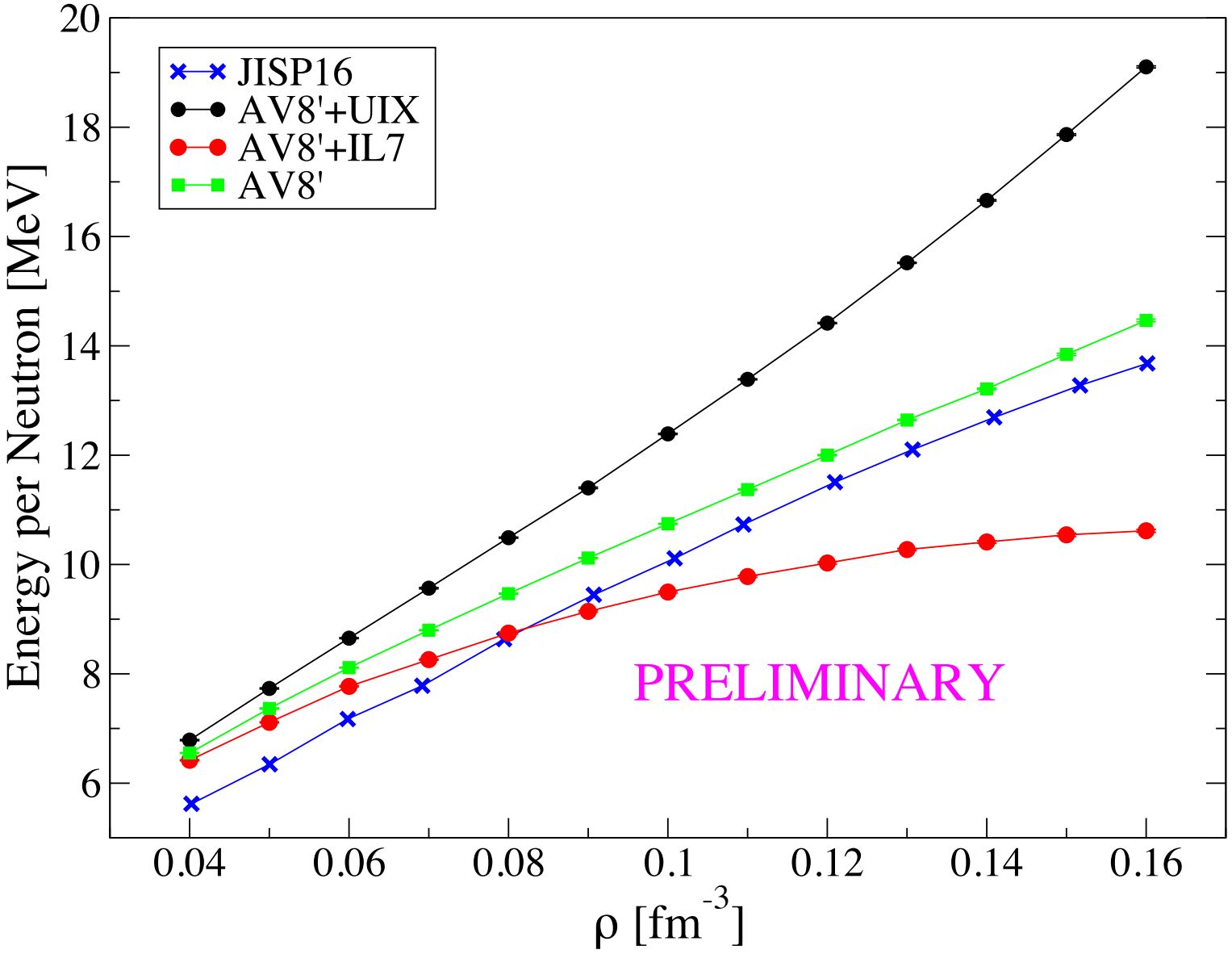
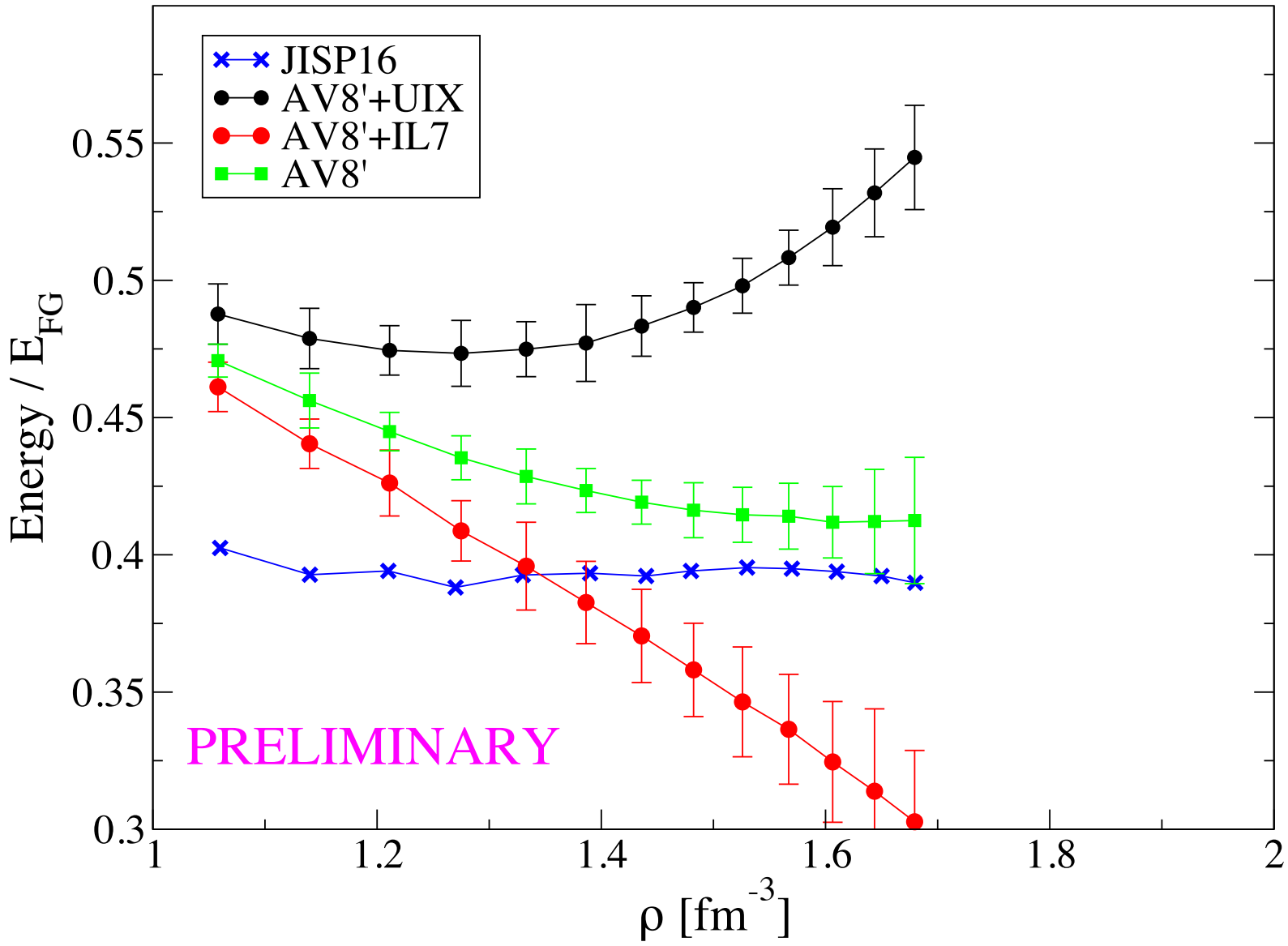
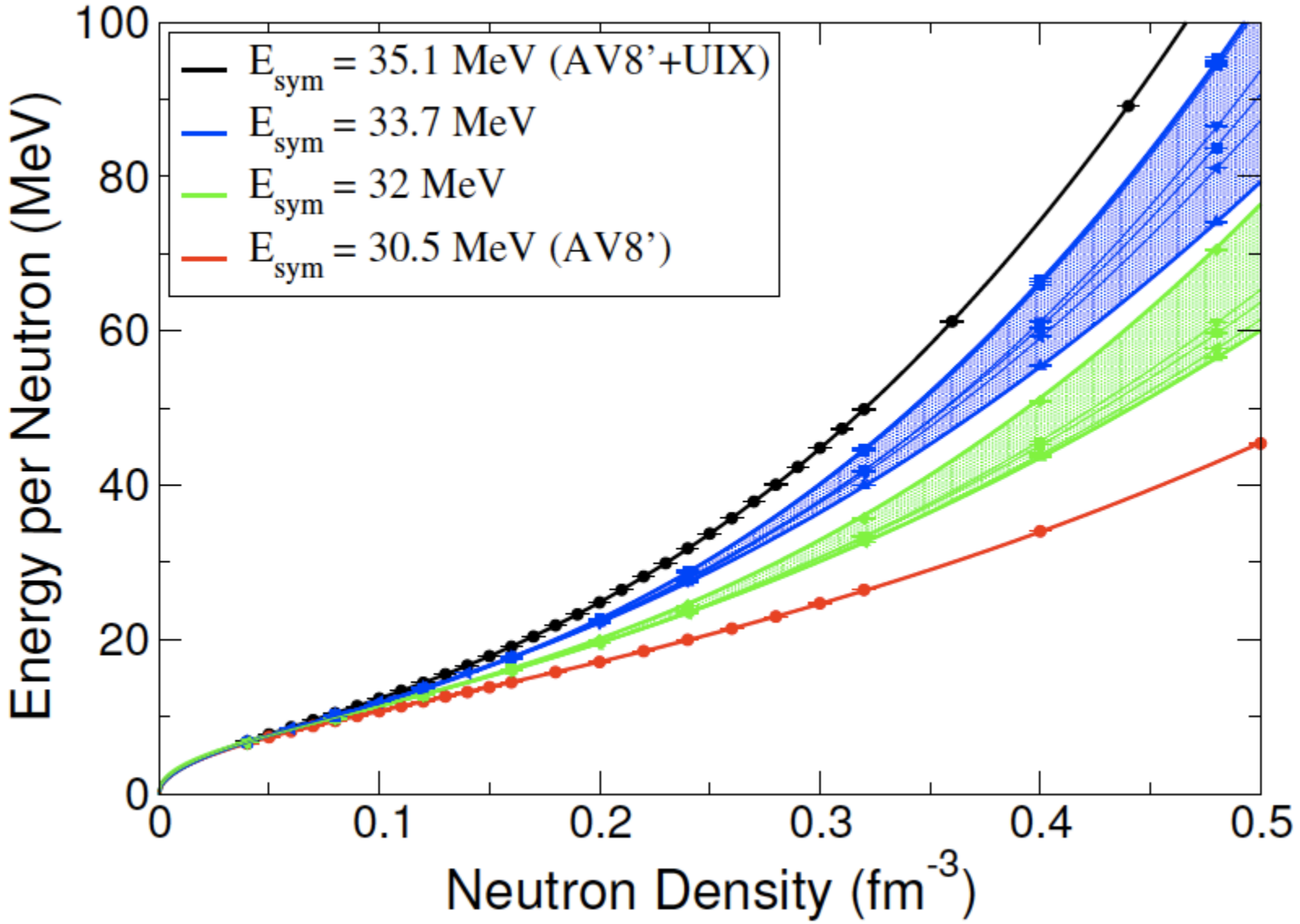
# Neutrons:
# Homogeneous and Inhomogeneous

# EOS for Drop Hamiltonians

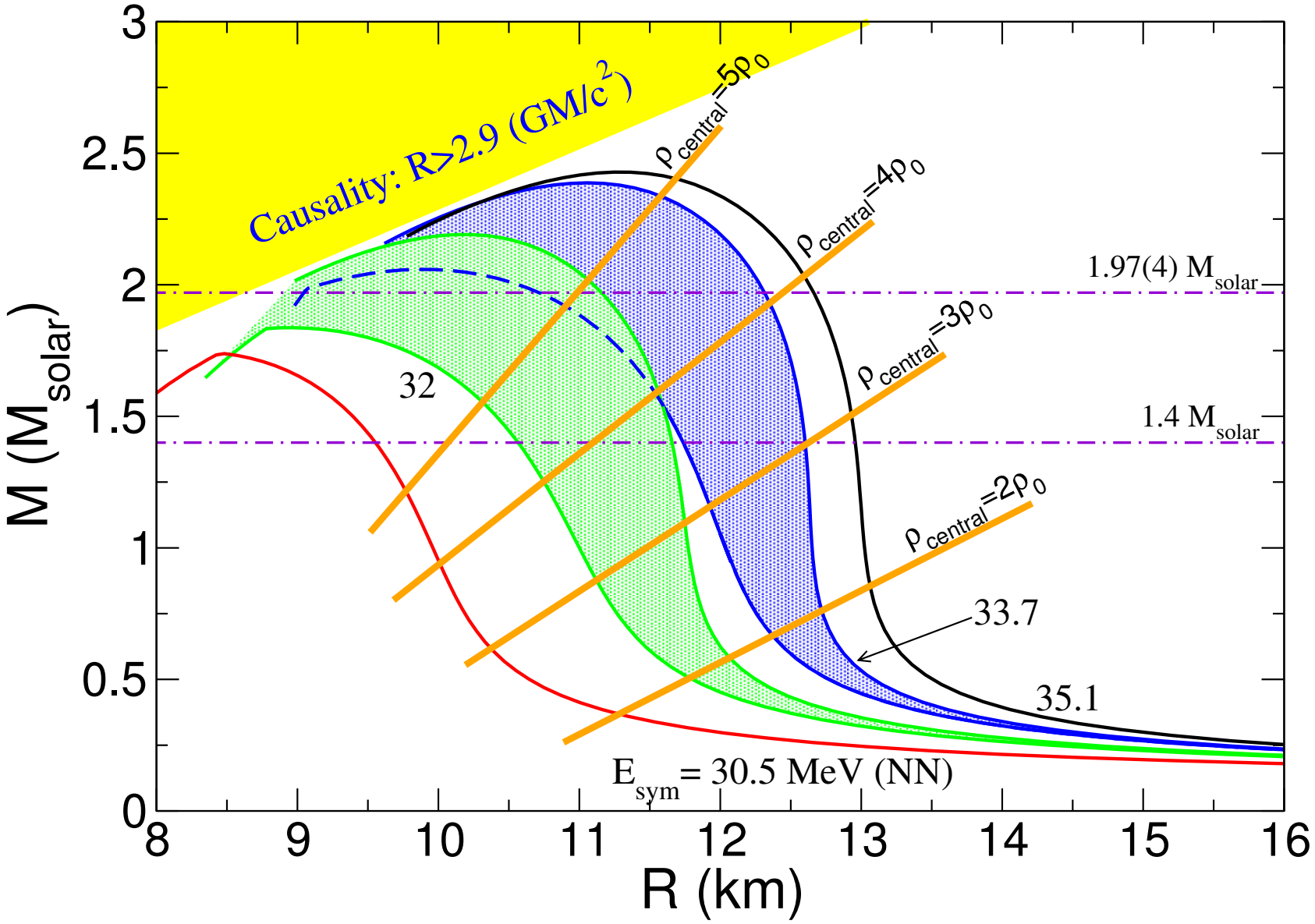



JISP16
AV8'+UIX
AV8'+IL7
AV8'
PRELIMINARY
Energy / E_FG
ρ [fm^-3]
0.3
0.35
0.4
0.45
0.5
0.55
1
1.2
1.4
1.6
1.8
2

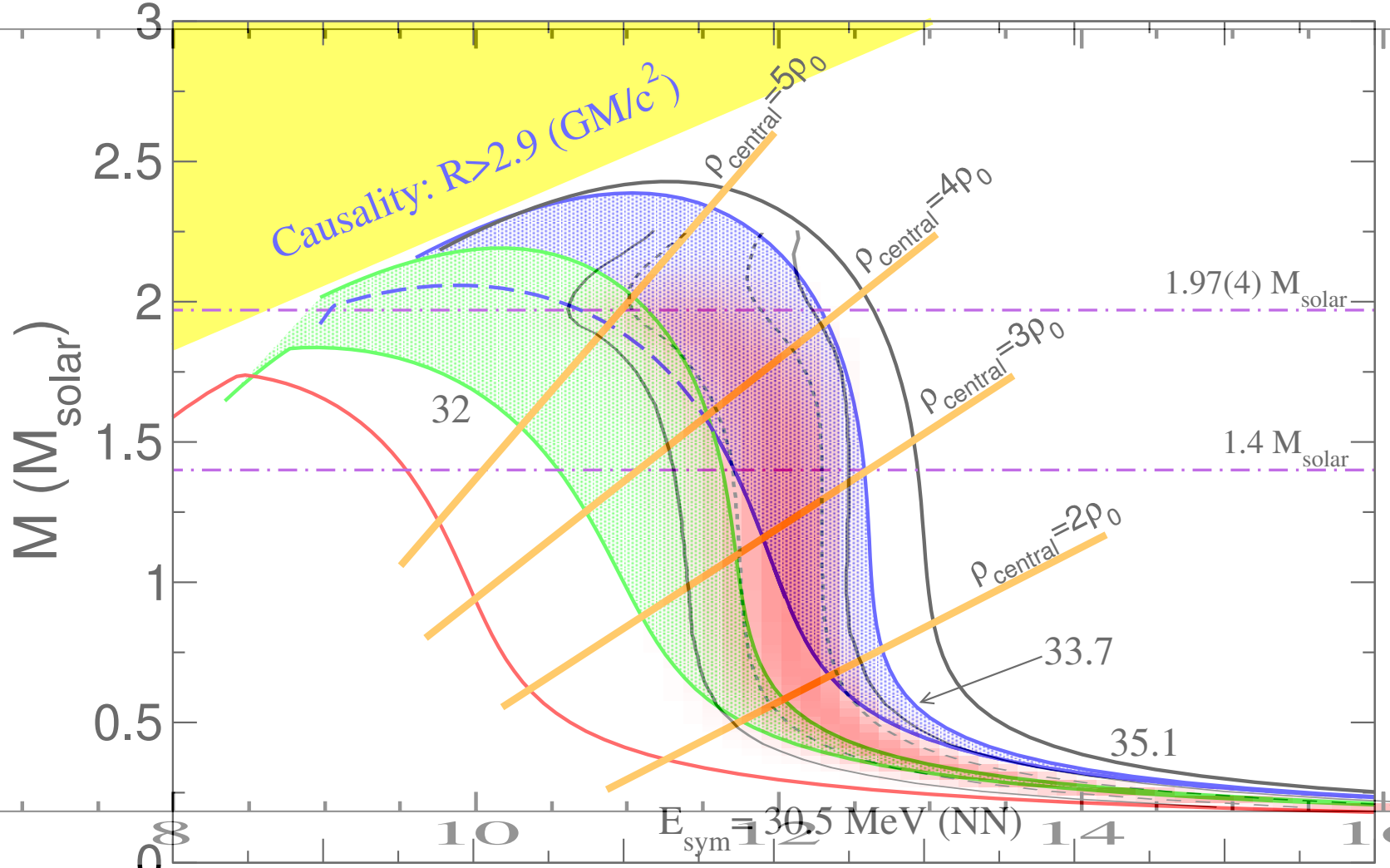
# Neutron Matter EOS



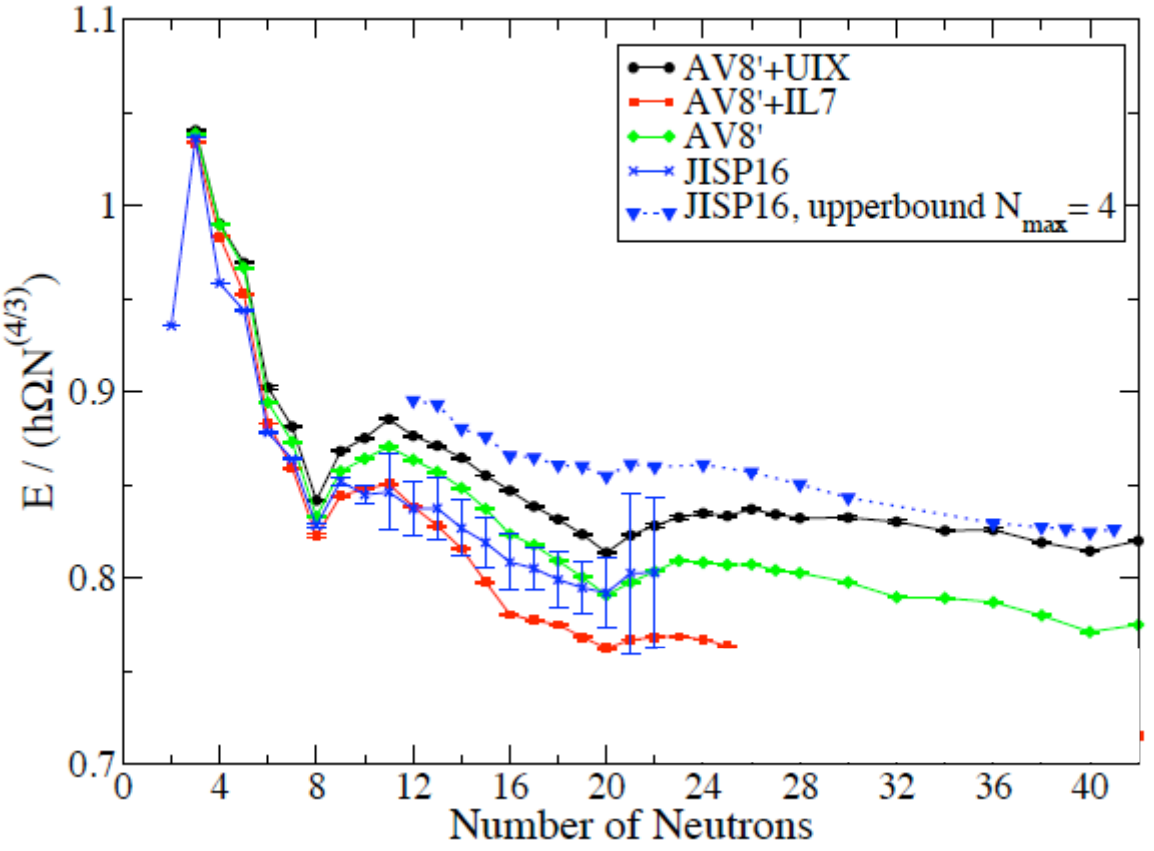
# Mass/Radius Bands for Different Symmetry Energies



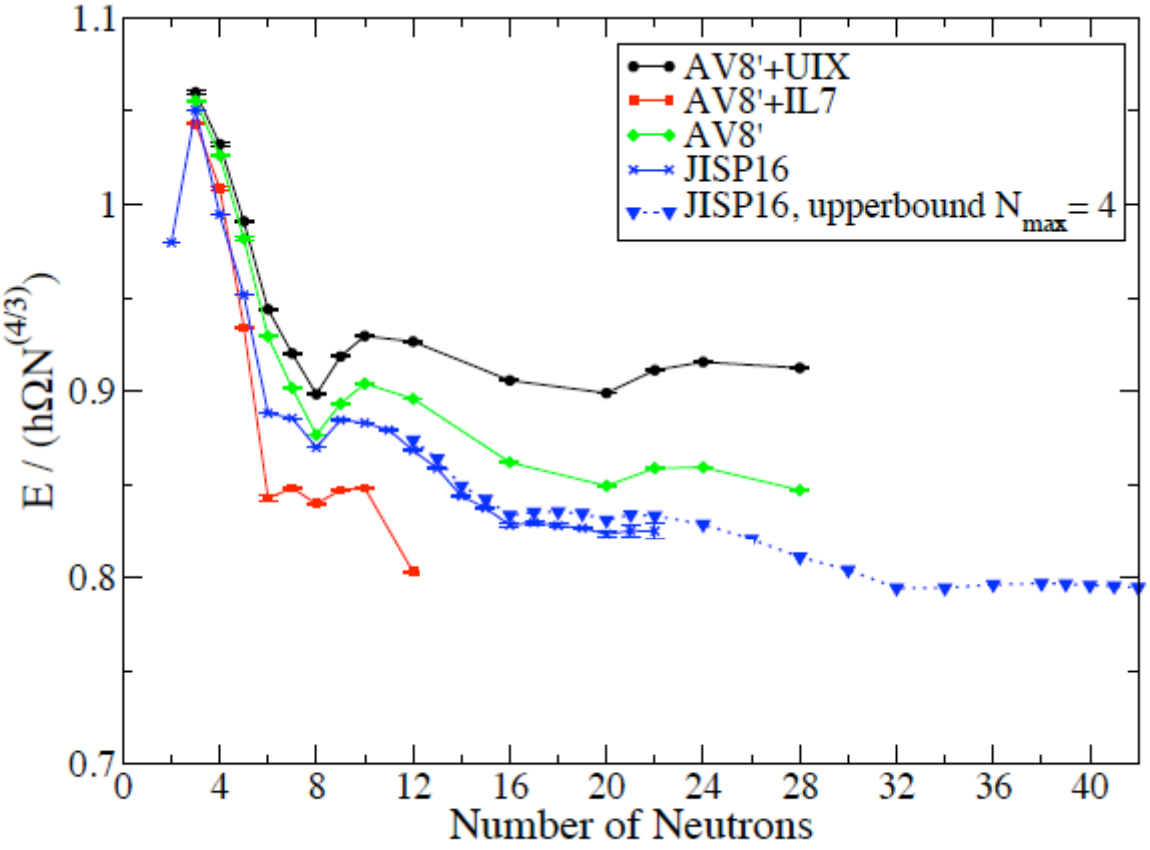
# Microscopic Theory vs. Observation



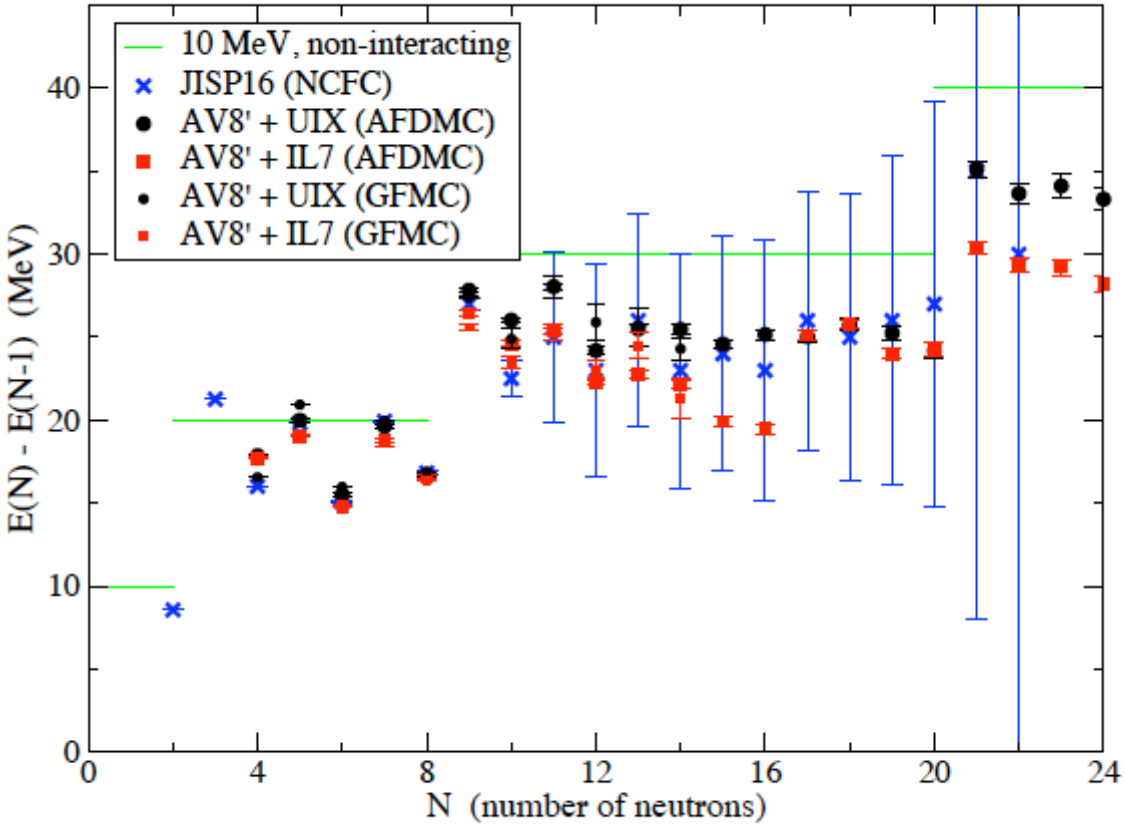
# Neutron Drops in 10 MeV H.O.



# Neutron Drops in 20 MeV H.O.



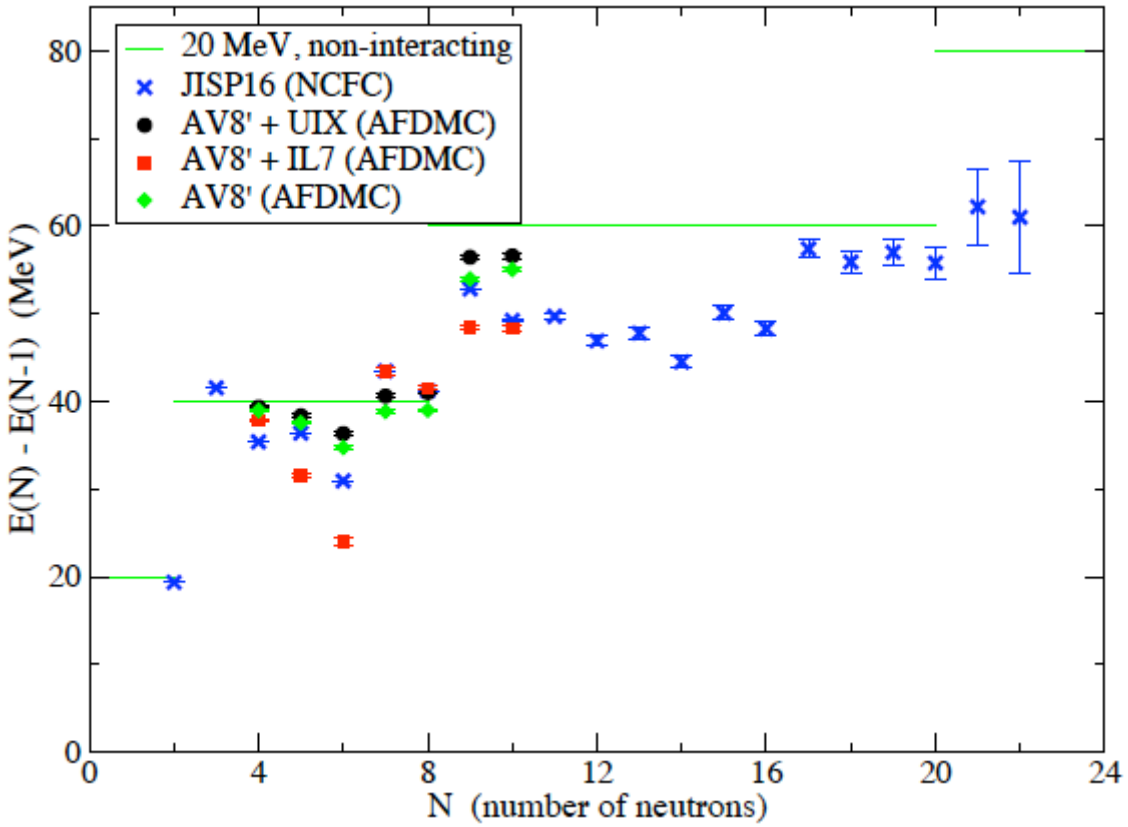
# Single-Particle Energies 10 MeV well




IL7 significant sub-shell closures (spin-orbit)

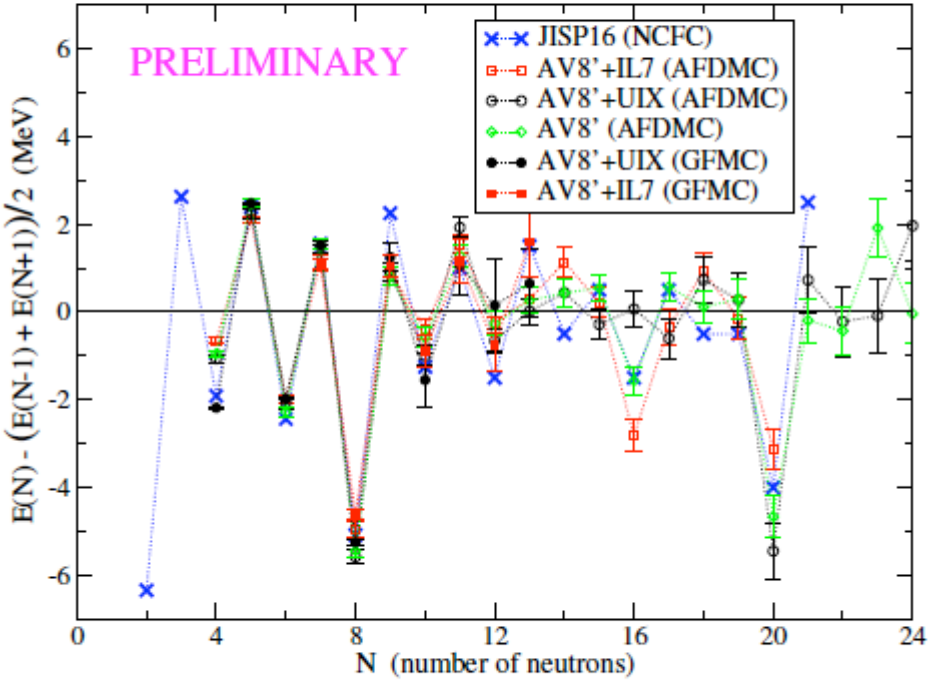
AV8' modest sub-shell closures

# Single-Particle Energies 20 MeV well

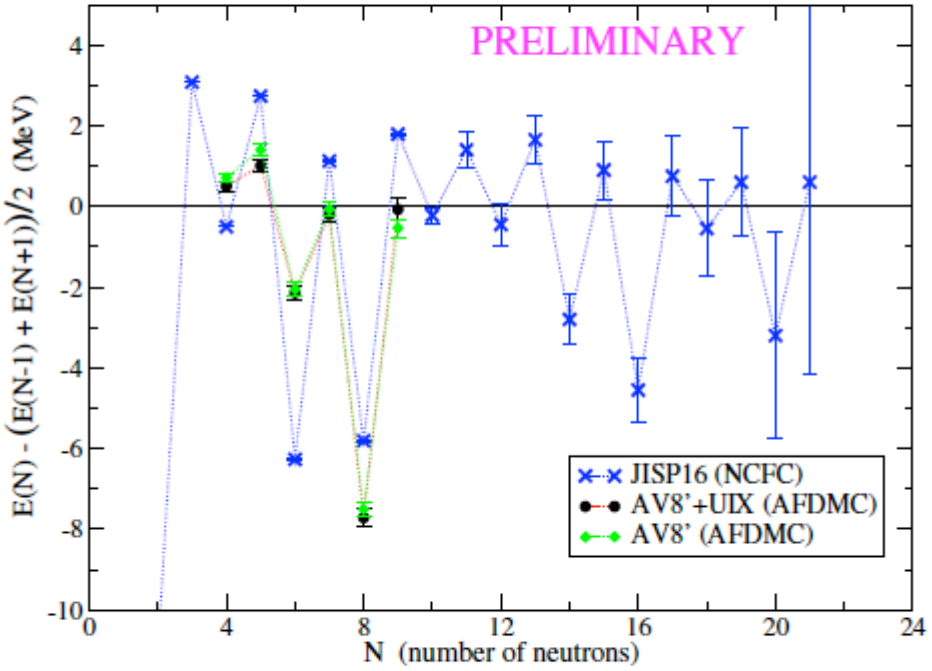


Double energy differences $E(N) - \frac{1}{2}(E(N-1) + E(N+1))$

$\hbar\omega = 10$ MeV



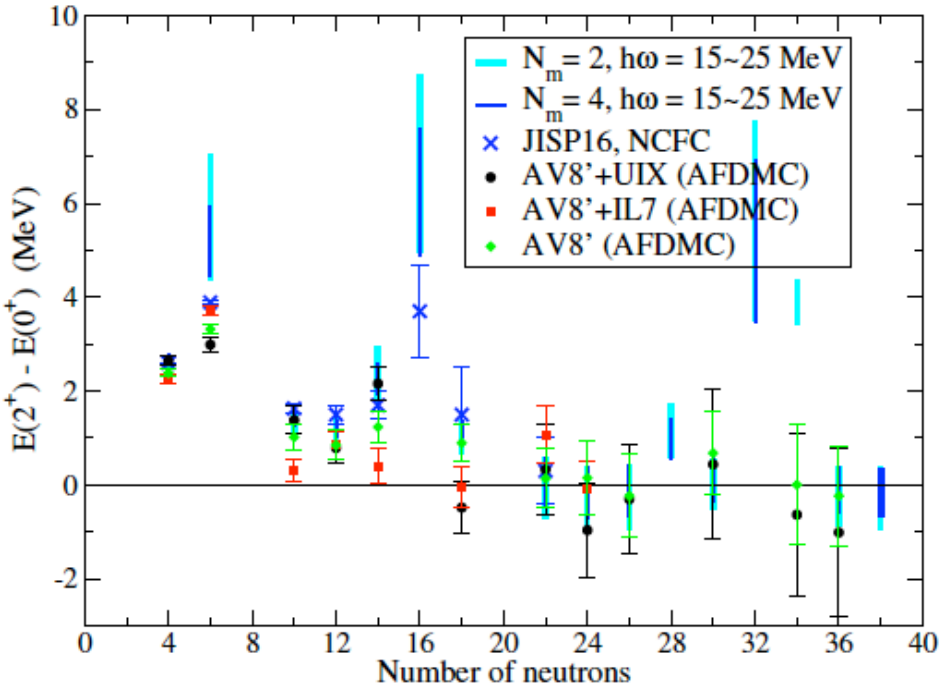

$\hbar\omega = 20$ MeV



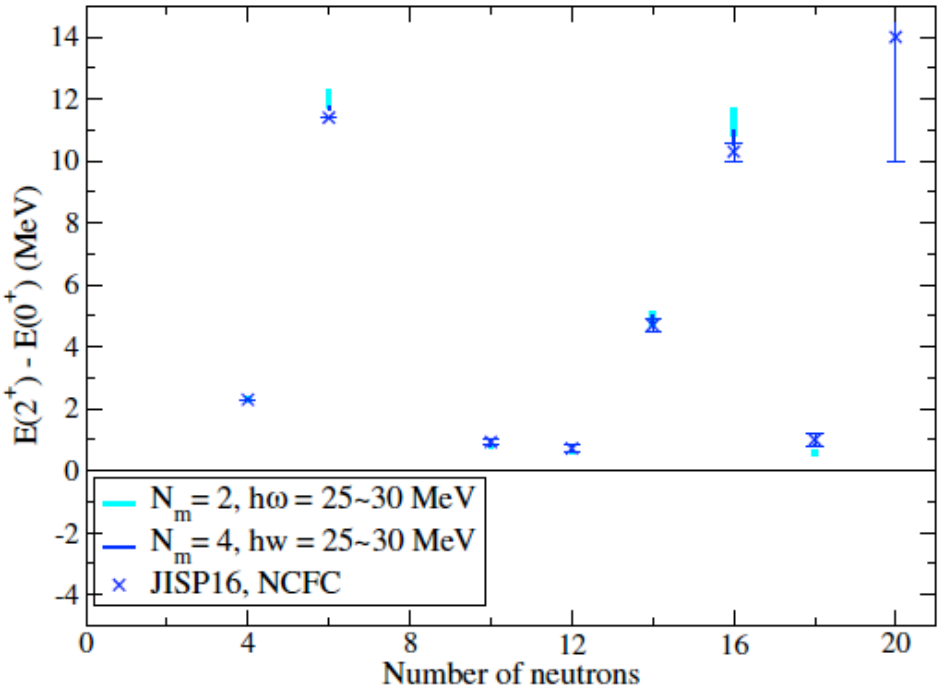

Carlson, Gandolfi, Pieper, Vary, Maris, work in progress

$0^+ - 2^+$ splitting

$\hbar\omega = 10$ MeV




$\hbar\omega = 20$ MeV




Carlson, Gandolfi, Pieper, Vary, Maris, work in progress

# Spin Response at q=0

Constraints from 3 sum rules, high-energy
from short-range NN calculation

$\chi/\chi_{FG} \approx 0.4$ Spin Susceptibility

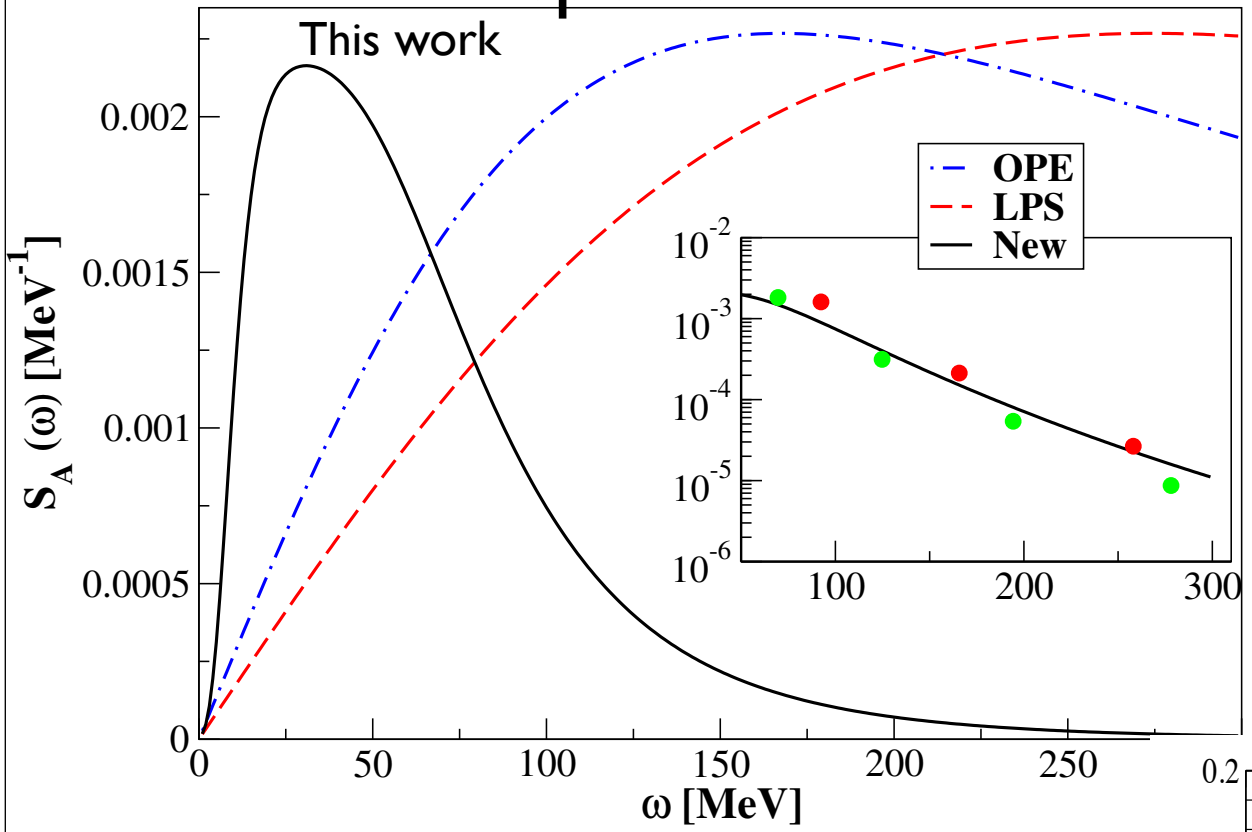
$S_0/S_{-1} \approx 40\ \mathrm{MeV}$ Structure Factor

$S_1/S_0 \approx 55\ \mathrm{MeV}$ Energy Weighted Sum Rule

Fantoni, Sarsa, and Schmidt PRL 87, 181101 (2001)

Sum Rules require a
fairly narrow peak around 50 MeV

# Response




Shen, Gandolfi, Reddy, and Carlson
in preparation

# Mean Free Path