I. Ab-initio inputs for Infinite Nuclear Matter

I. Current situation

♣ Exists for some time: SNM/PNM EOS and $a_I$
  - VCS calculations with $NN/NNN$ forces; \{Akmal et al. (1998) for EOS
    Lagaris and Pandharipande (1981) for $a_I$
  - Not a good enough test of the quality of isovector properties of the functional

♣ Only recently: $\varepsilon_{pol}^{(S,T)}$ in SNM, $m_s^*$, $\Delta m_{n-p}(I)$ in ANM, $e_k$ at different $(k_F,I)$

- BHF calculations with $NN/NNN$ forces; Baldo, private comm.
- Nice inputs not yet well exploited; but do not come with "error bars"
- Still rely on hard core potential picture
II. INM calculations with low-momentum interactions

 Ramsey: First attempt already available; S. Bogner et al. NPA (2005)

\begin{itemize}
  \item MBPT2 seems fine (at least \(\approx \rho_{sat}\)) which is a VERY good news
  \item Improved calculations under way (Scott, Achim, Dick)
  \item Power counting at finite density to come... (Scott, Achim, Dick)
  \item It would be nice to have predictions for
    \begin{itemize}
      \item Potential energy per \((S,T)\) channel \(\xi_{pot}^{(S,T)}\) in SNM
      \item Effective masses at the Fermi surface \(m_s^*, \Delta m_{n-p}^*(I)\) in ANM
      \item Momentum-dependent (on-shell) self-energy \(e_k\) for different \((k_F, I)\)
      \item As a function of \(\Lambda\) to provide theoretical "error bars" that can be used in the fit
    \end{itemize}
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