Ab initio no-core shell model (NCSM) & resonating-group method (RGM)
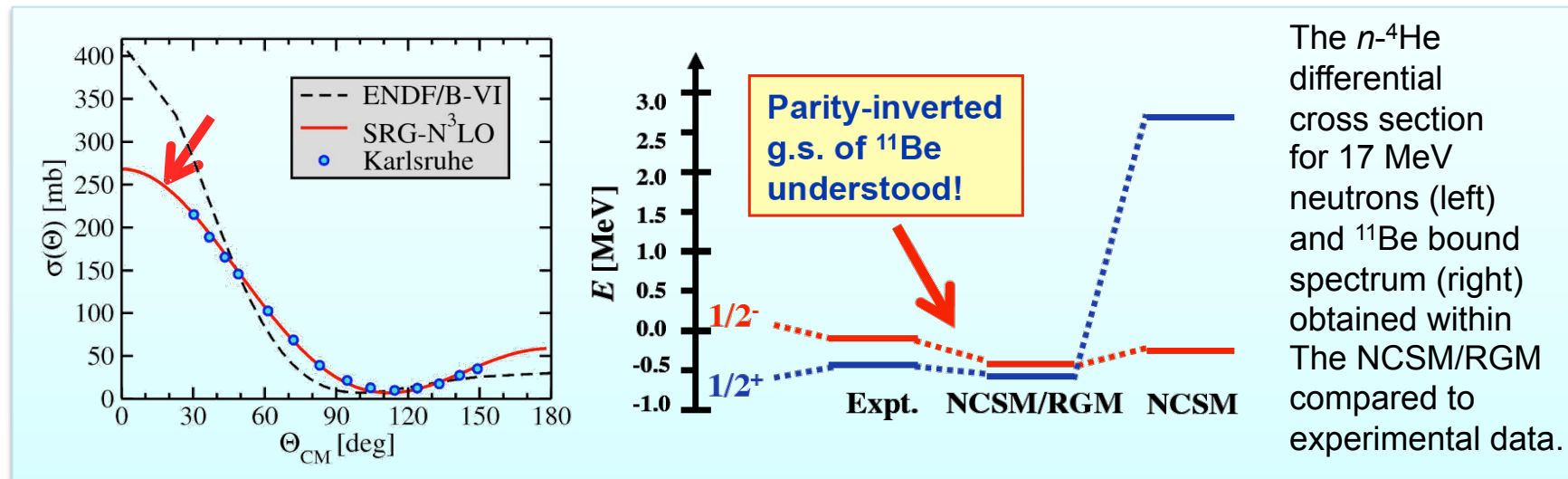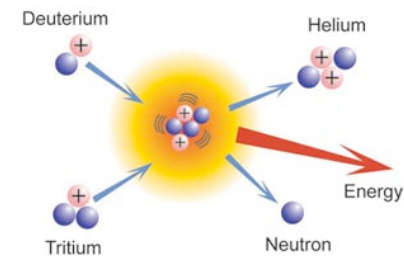
S.Quaglioni and P. Navrátil, PRL101, 092501 (2008); PRC79, 044606 (2009)

- **NCSM/RGM** – **dynamic & static properties of light nuclei**

  - *Ab initio* calculations for reactions and clustering in nuclei

  - Unified description of bound, resonant and continuum states

  - Understanding of reactions for fusion-energy generation

Matrix diagonalization and eigenvector analysis
Dimensions of ~ 10^9

Parity-inverted g.s. of ^{11}Be understood!

The *n*-^{4}He differential cross section for 17 MeV neutrons (left) and ^{11}Be bound spectrum (right) obtained within The NCSM/RGM compared to experimental data.