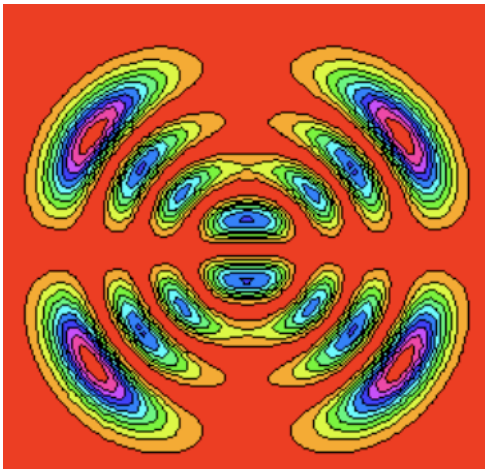


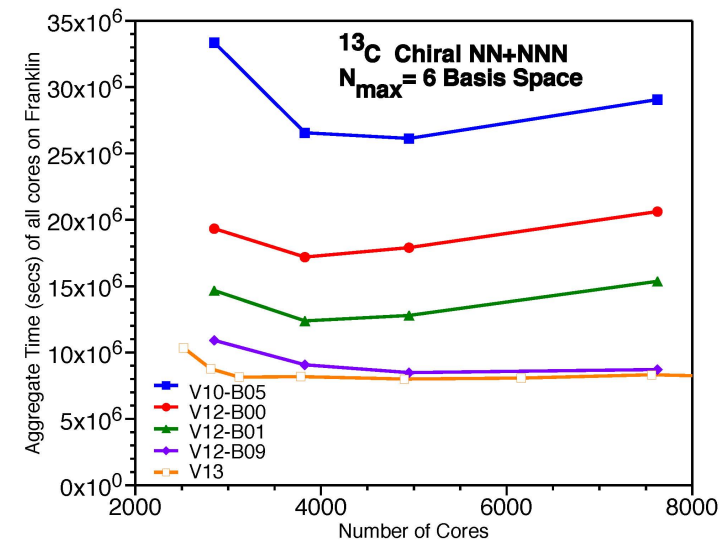
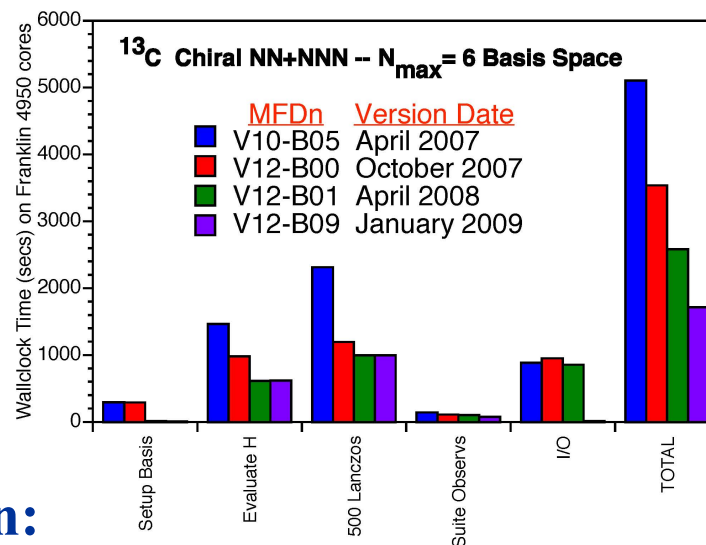
# UNEDF-TOPS eigensolver collaboration: Breakthrough nuclear science

## UNEDF's MFDn configuration interaction code

used in predictive discoveries of  $^{14}\text{F}$  properties  
exotic nucleus with extreme proton-to-neutron ratio  
ran on 30,000 cores on ORNL's Cray XT5



sample harmonic oscillator basis function



## Improvements in MFDn:

- new discrete/combinational algorithms
- enhanced inner loop and I/O performance
- 3-6x improvements in execution time
- strong scaling demonstrated up to 10,000 cores on NERSC's Cray XT4