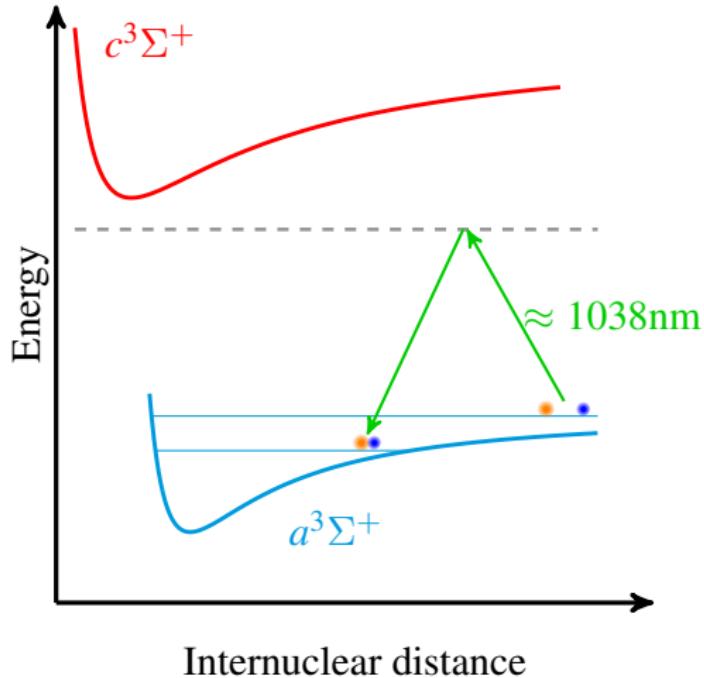


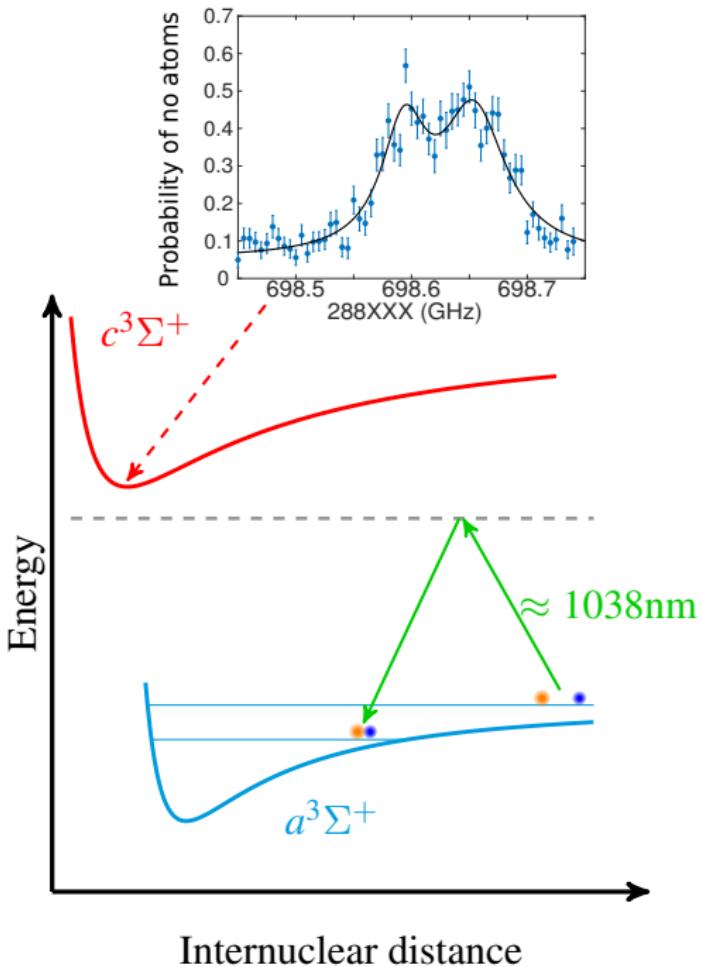
NaCs lab update

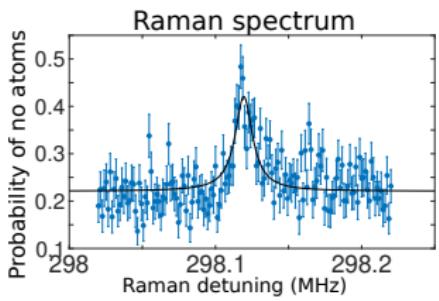
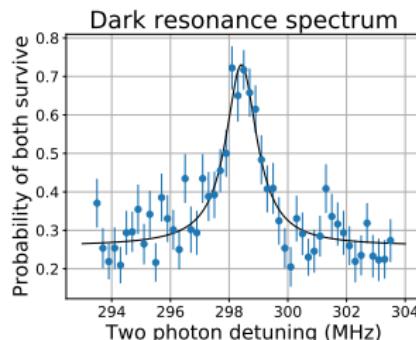
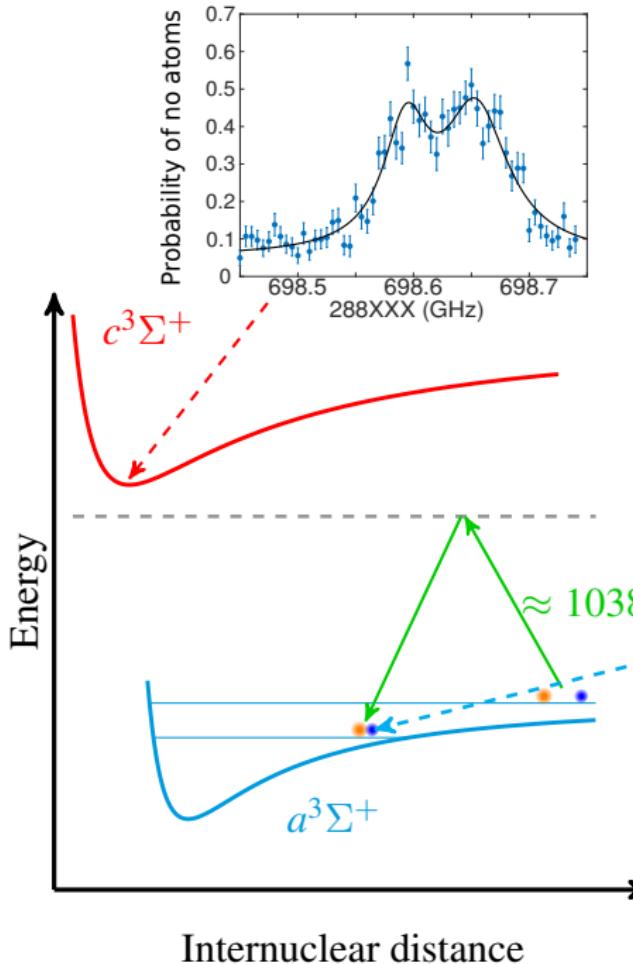
Yichao Yu

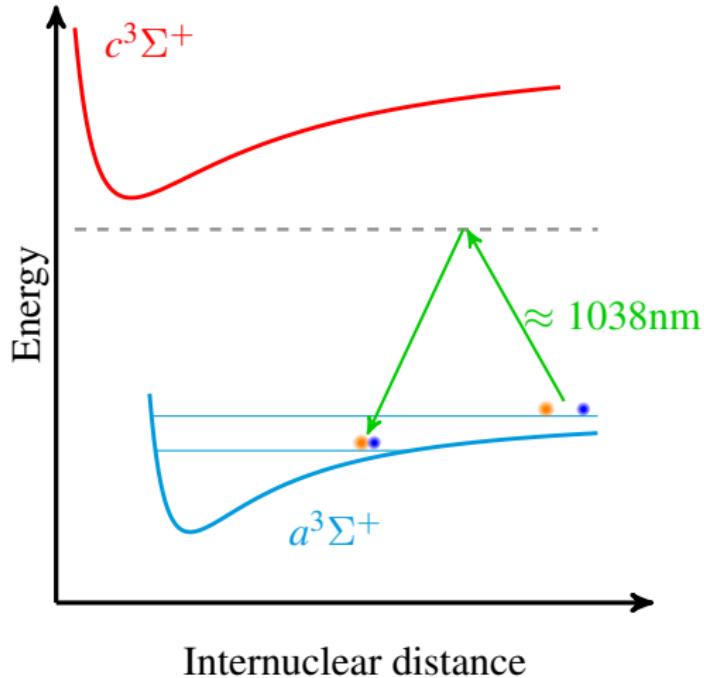
Ni Group

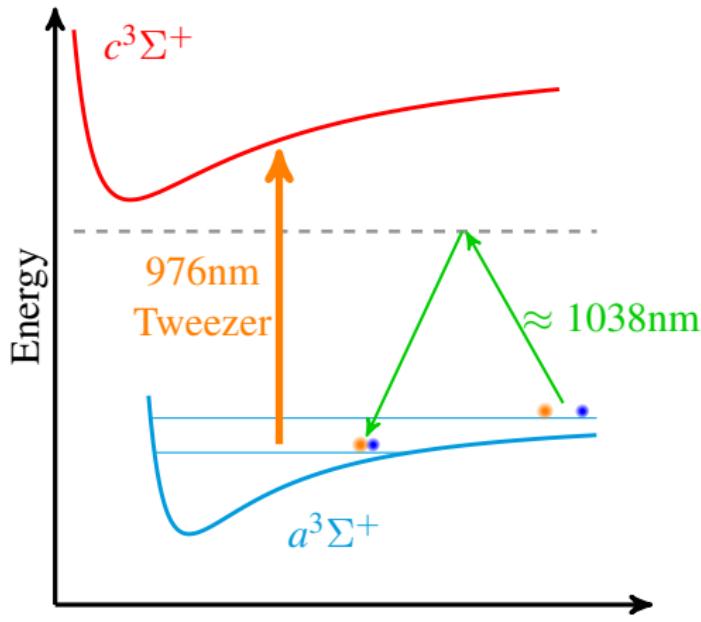
Sep. 28, 2018





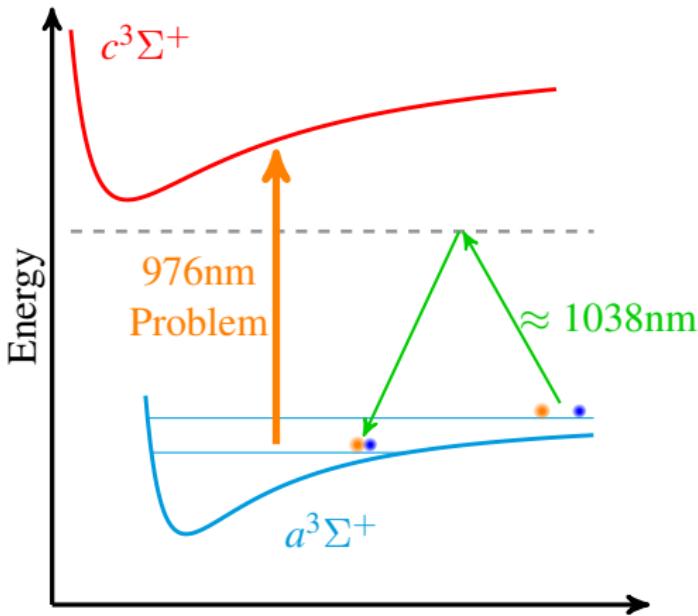






1038nm:
Power: 10mW
Size: $12\mu\text{m}$

976nm:
Power: 15mW
Size: $0.7\mu\text{m}$



1038nm:

Power: 10mW

Size: $12\mu\text{m}$

Rabi frequency: $\approx 100\text{Hz}$

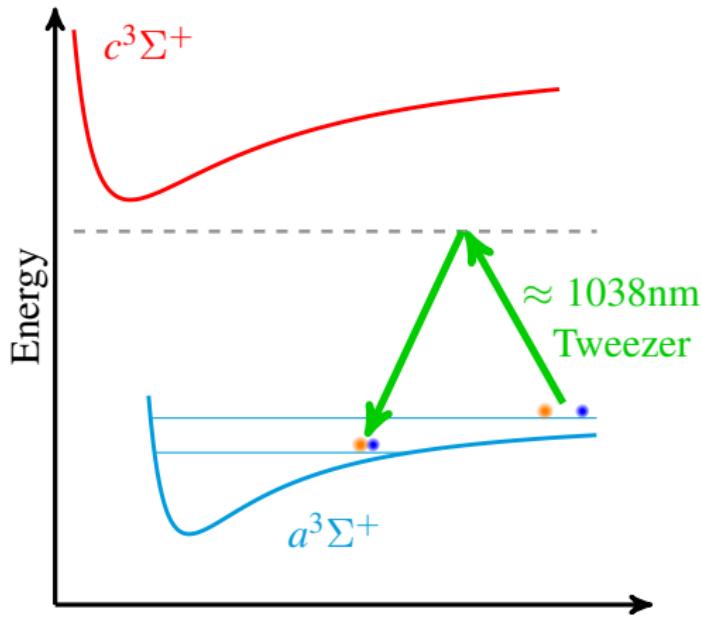
976nm:

Power: 15mW

Size: $0.7\mu\text{m}$

Stark shift: 300kHz

Scattering: $\approx 10\text{kHz}$ (molecular state)



1038nm:

Power: 15mW

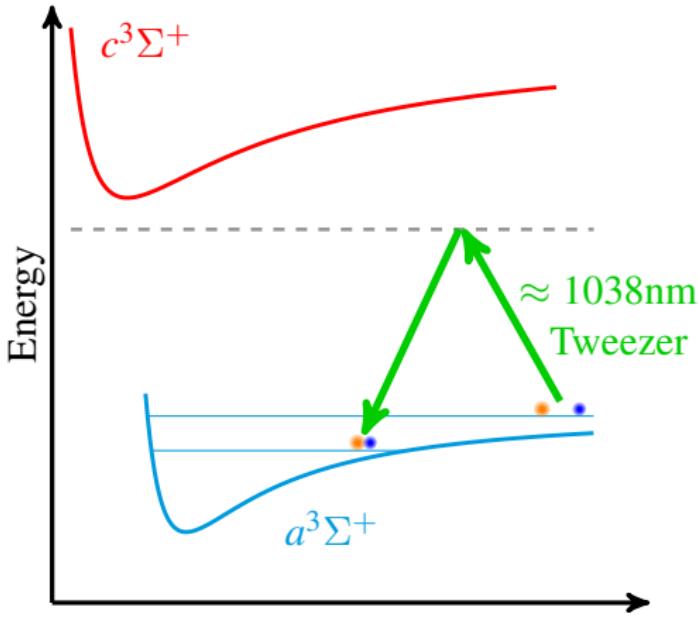
Size: $0.7\mu\text{m}$

Rabi frequency: $\approx 3\text{kHz}$

Stark shift: $\approx 200\text{kHz}$

Scattering: $\approx 160\text{Hz}$

(at $\delta = -100\text{GHz}$)



1038nm:

Power: 15mW

Size: $0.7\mu\text{m}$

Rabi frequency: $\approx 3\text{kHz}$

Stark shift: $\approx 200\text{kHz}$

Scattering: $\approx 160\text{Hz}$

(at $\delta = -100\text{GHz}$)

Use tunable liquid crystal waveplate from Meadowlark to switch between full power tweezer and Raman configuration during the sequence.

Interaction shift

Goal

- Calculate binding energy
- Refine Feshbach resonance prediction

Interaction shift

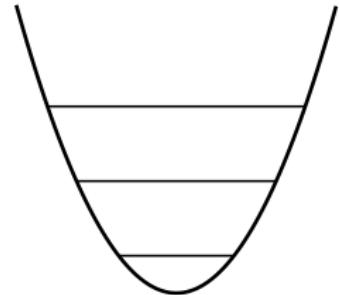
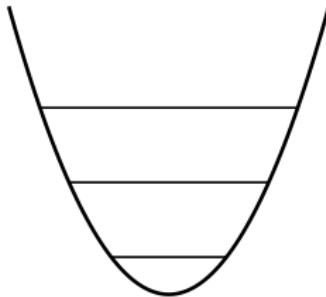
Goal

- Calculate binding energy
- Refine Feshbach resonance prediction

Interaction shift

Goal

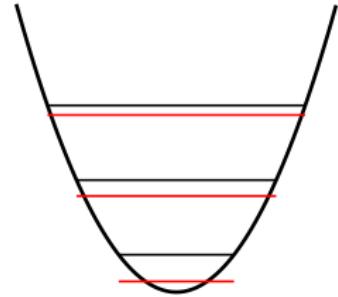
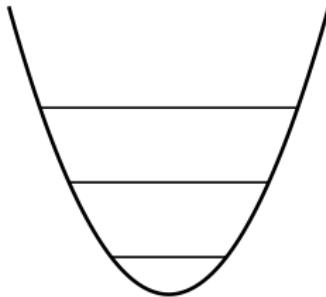
- Calculate binding energy
- Refine Feshbach resonance prediction



Interaction shift

Goal

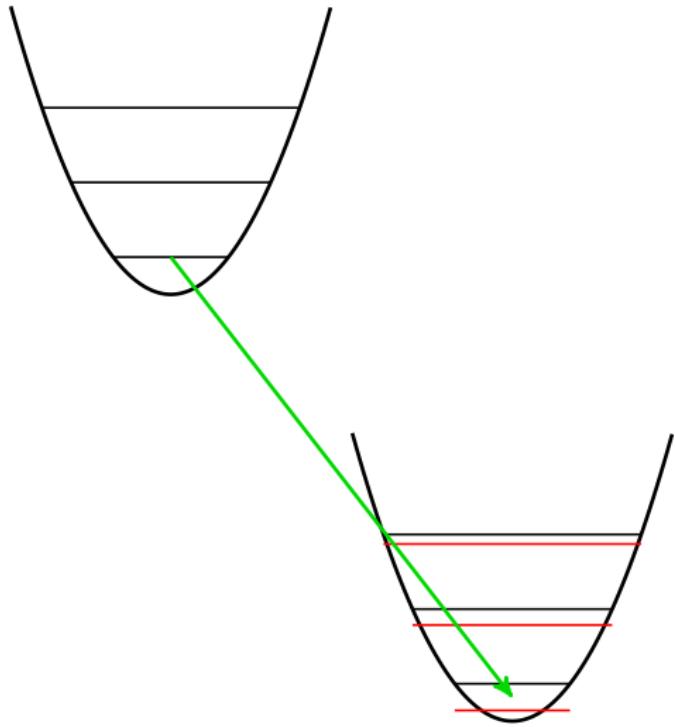
- Calculate binding energy
- Refine Feshbach resonance prediction



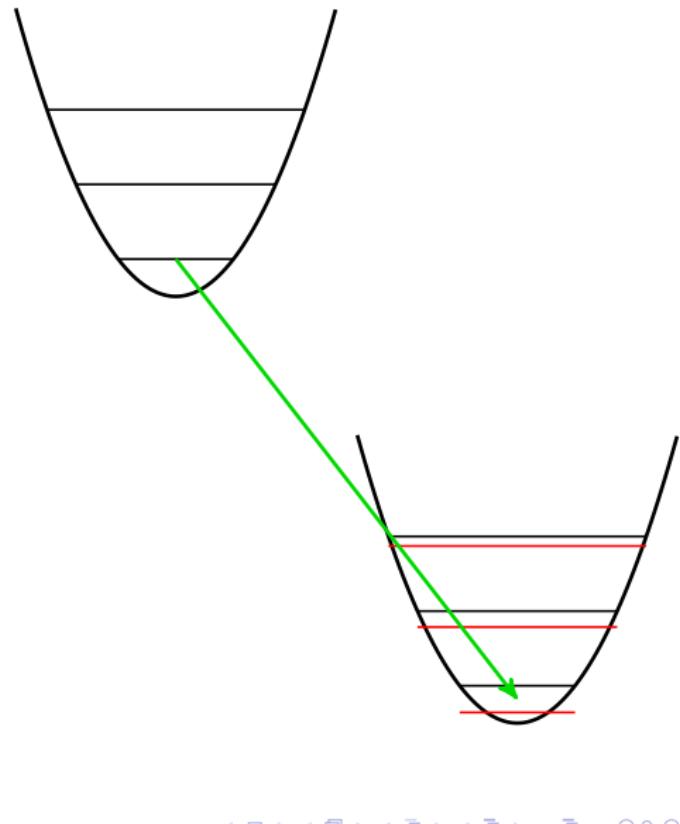
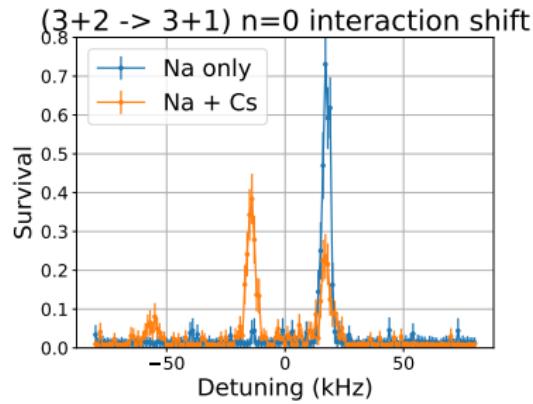
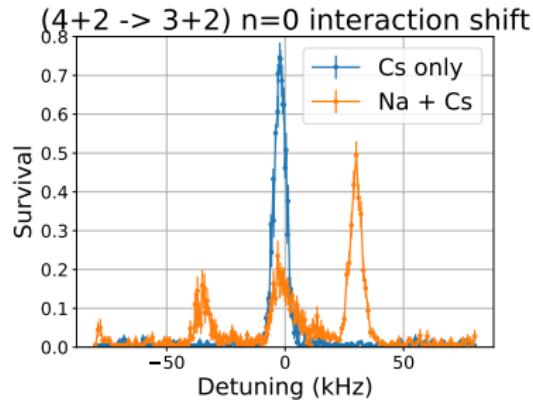
Interaction shift

Goal

- Calculate binding energy
- Refine Feshbach resonance prediction

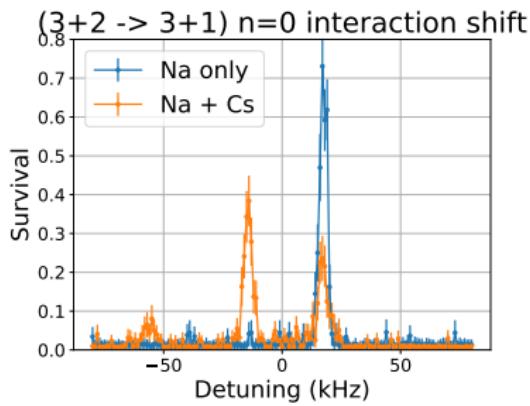
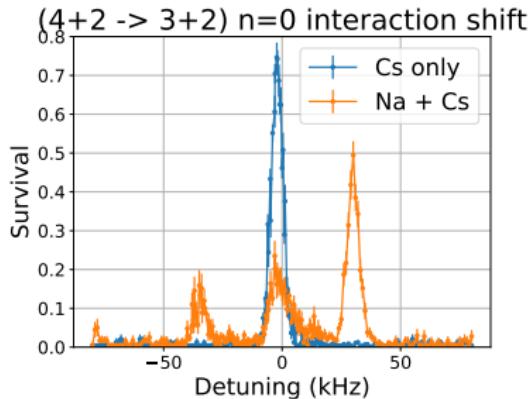


Interaction shift



Interaction shift

Shift \leftrightarrow Scattering length

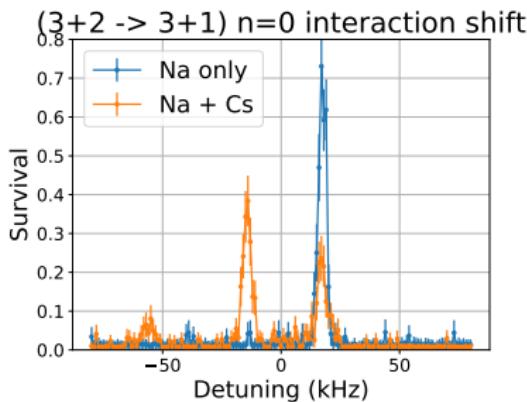
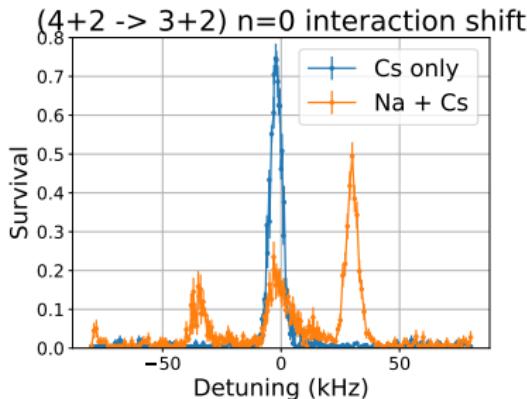


- First order perturbation

$$\delta E \propto a$$

- Full diagonalization

Interaction shift



Shift \leftrightarrow Scattering length

- First order perturbation

$$\delta E \propto a$$

- Full diagonalization

