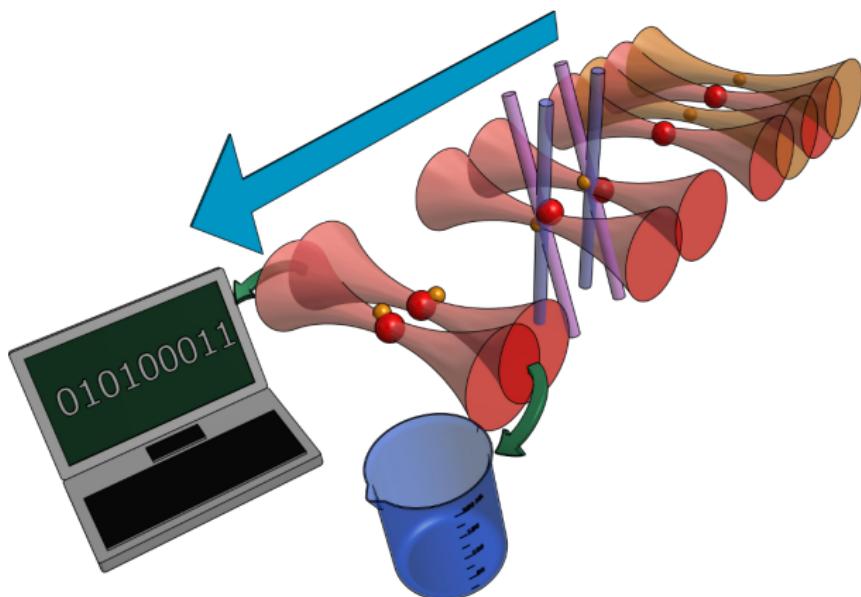


Apparatus for making dipolar NaCs molecules

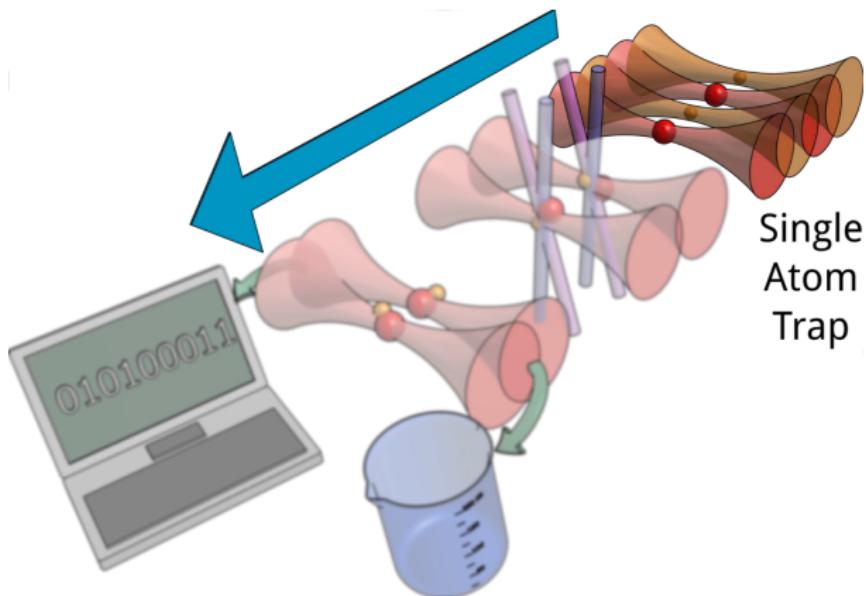


Yichao Yu

May 3, 2015

Harvard/Ni Group

Apparatus for making dipolar NaCs molecules

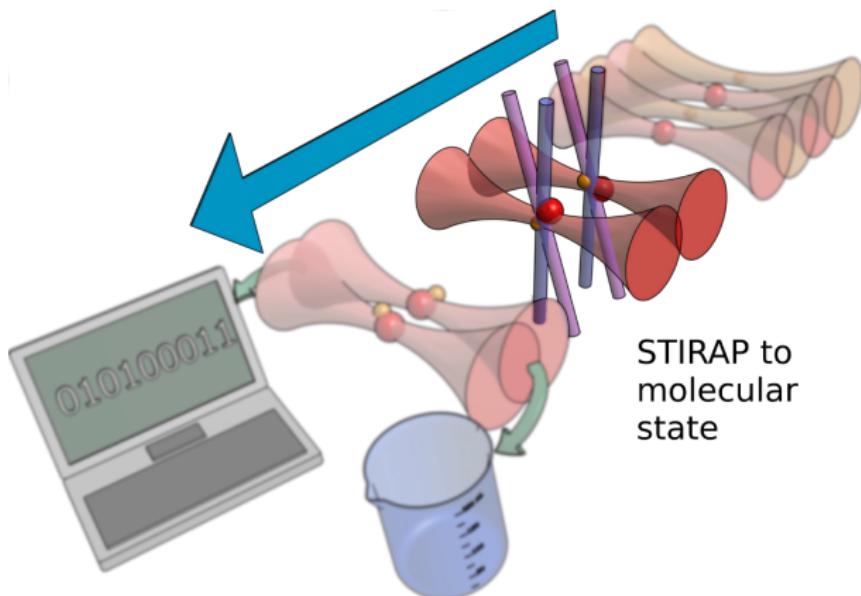


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Apparatus for making dipolar NaCs molecules

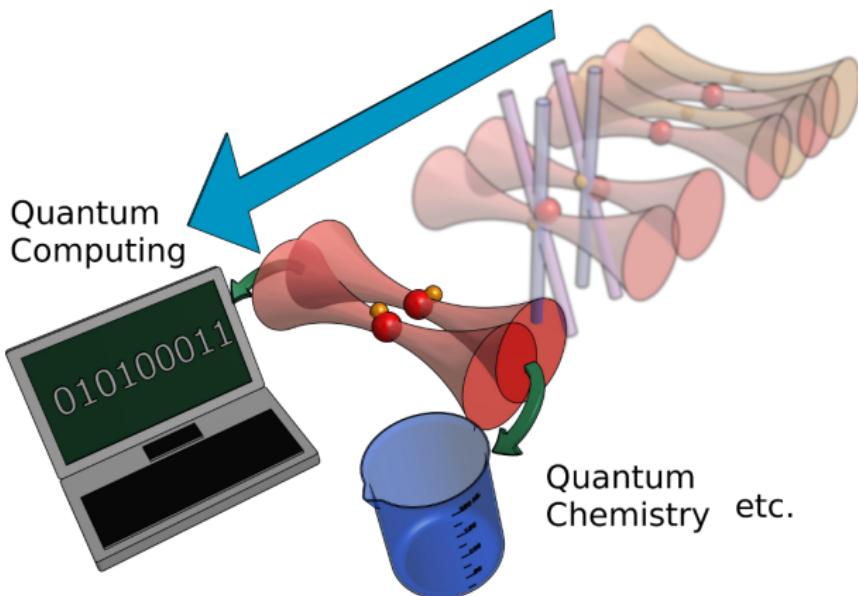


Yichao Yu

May 3, 2015

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Apparatus for making dipolar NaCs molecules



Yichao Yu

May 3, 2015

Harvard/Ni Group

Current state

Cesium



Current state

Cesium

MOT

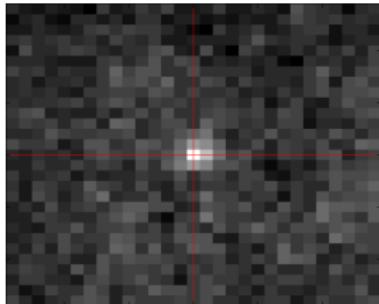


Current state

Cesium

MOT

Trapping
single
atom



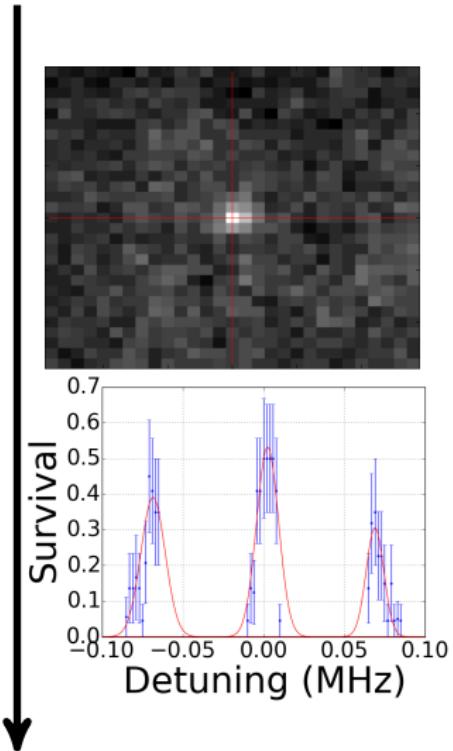
Current state

Cesium

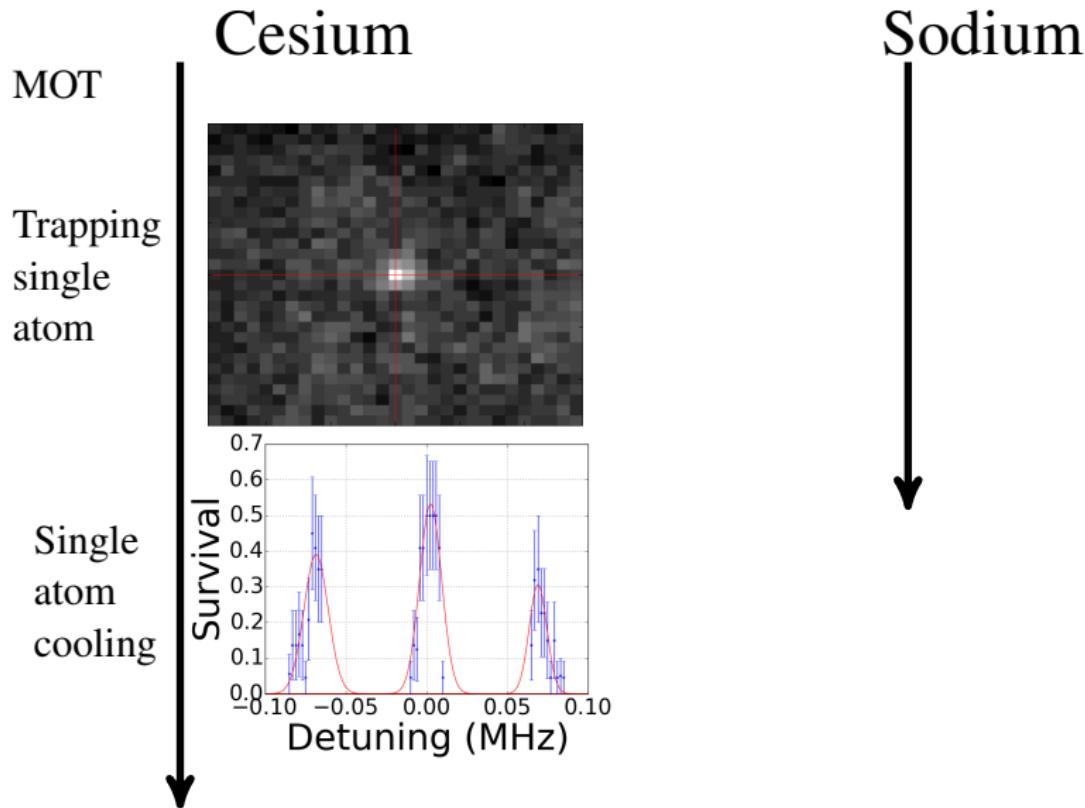
MOT

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atom

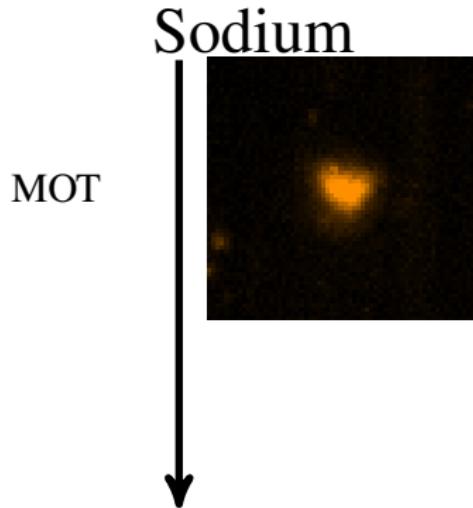
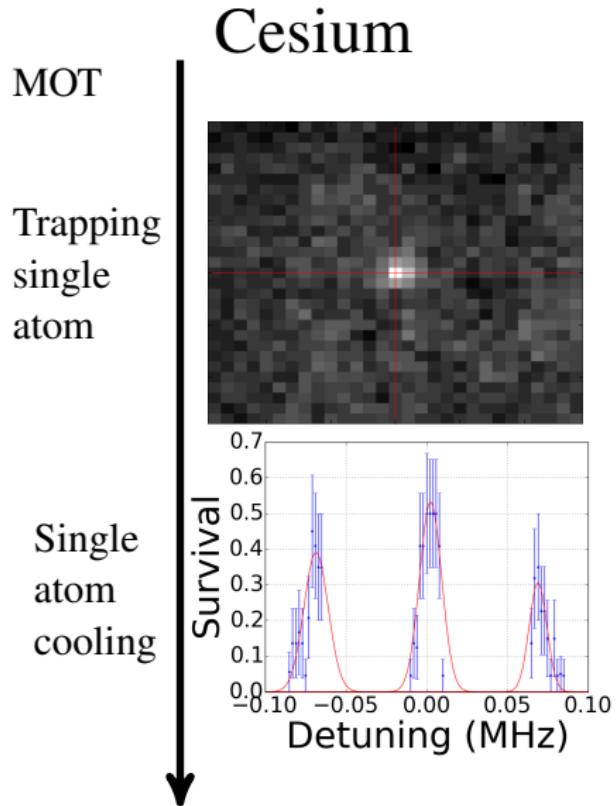
Single
atom
cooling



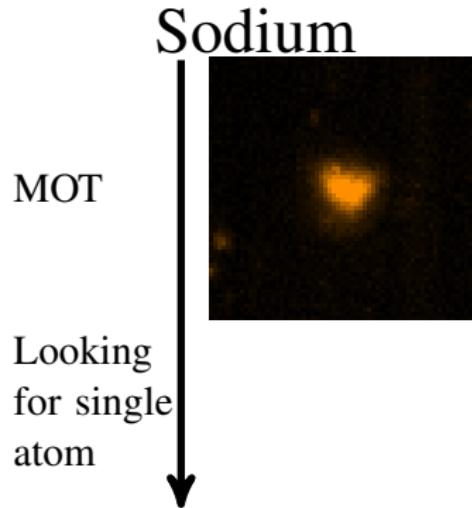
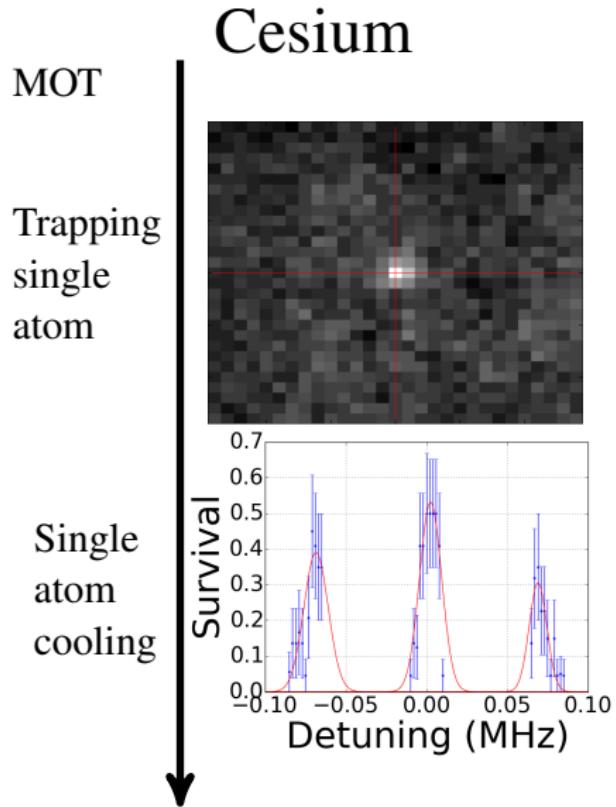
Current state



Current state



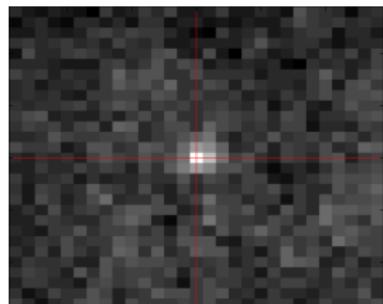
Current state



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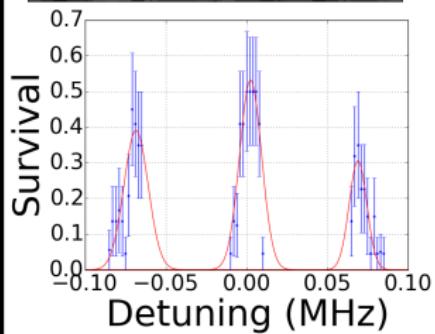
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MOT



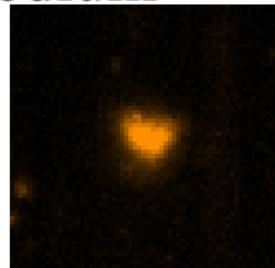
Trapping
single
atom

Single
atom
cooling



Sodium

MOT



Looking
for single
atom

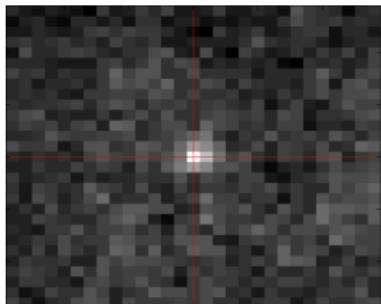
Problems

- Sodium laser
- MOT stability

Current state

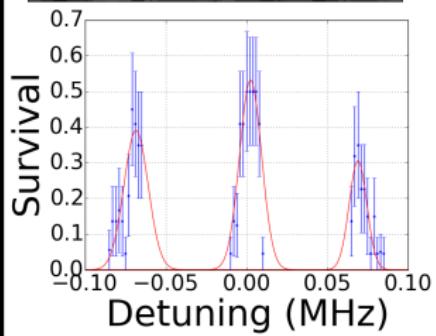
Cesium

MOT



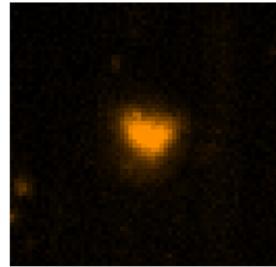
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atom

Single
atom
cooling



Sodium

MOT



Looking
for single
atom

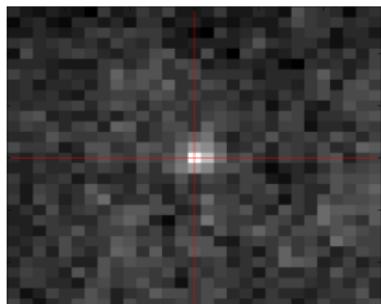
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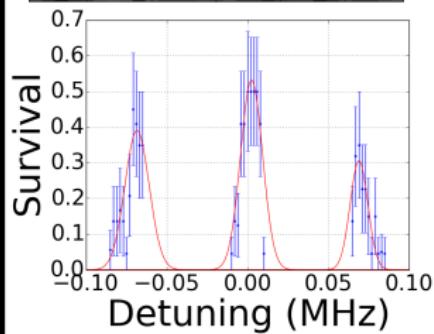
Cesium

MOT



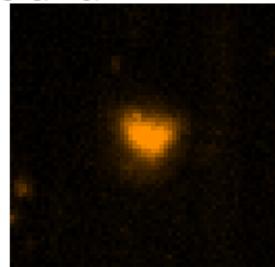
Trapping
single
atom

Single
atom
cooling



Sodium

MOT



Looking
for single
atom

Problems

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- MOT stability

Laser system for Sodium

Sodium wavelengths

- D lines \approx 589nm
- D2 line (Cooling, Imaging)
- D1 line (Pumping, Cooling)
- Off resonance (Raman transition)

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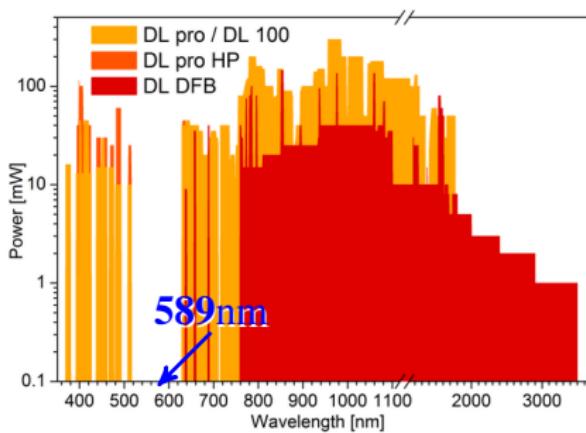
Using diode laser

- Diode laser spectrum
- Power requirement for frequency doubling
- Diode laser from Innolume Tunable 1175-1280nm
- Waveguide doubler

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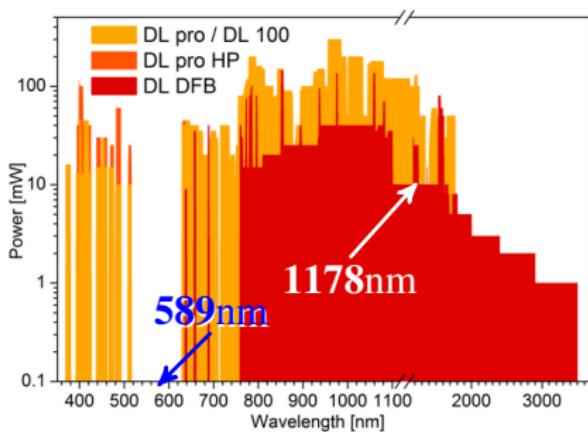


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Using doubled diode laser

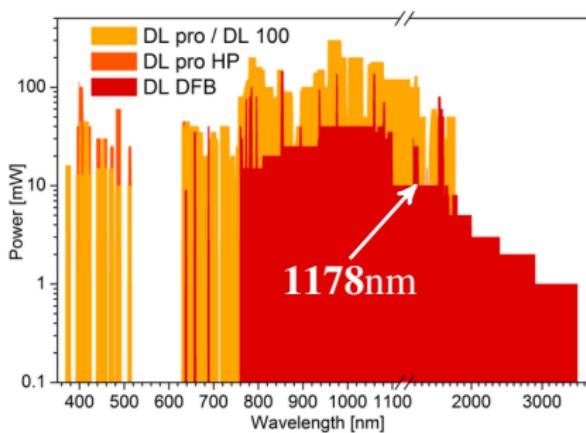
$$589 \times 2 = 1178\text{nm}$$

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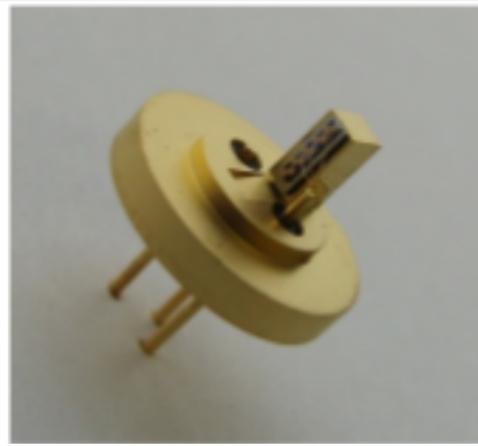
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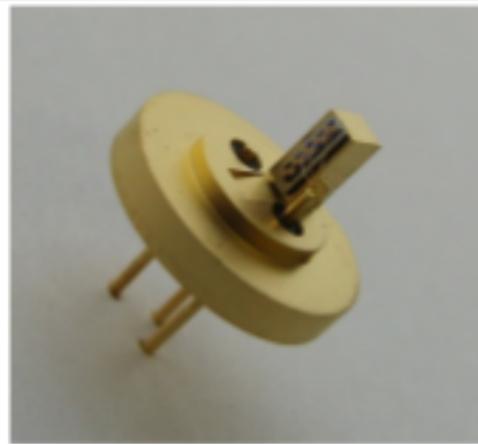
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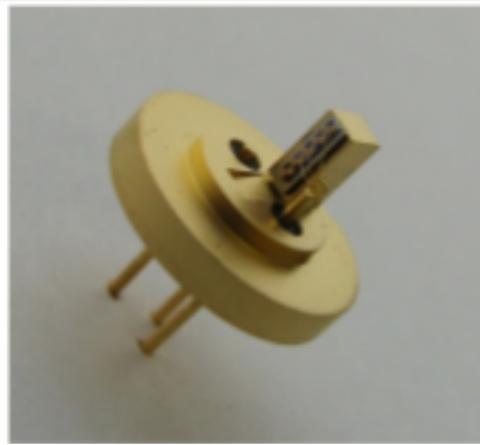
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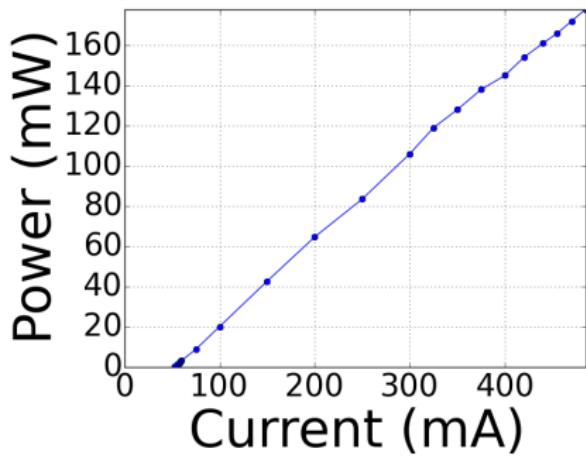
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Using doubled diode laser

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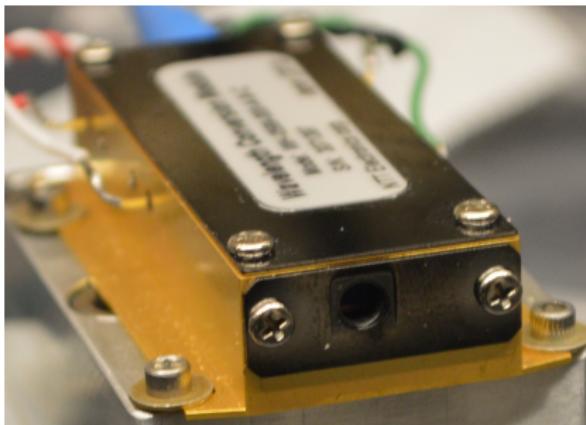
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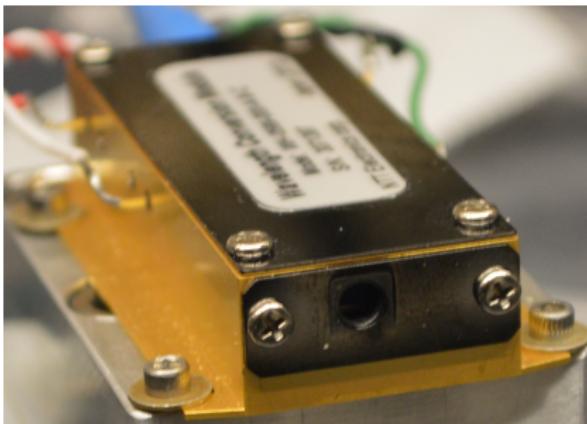
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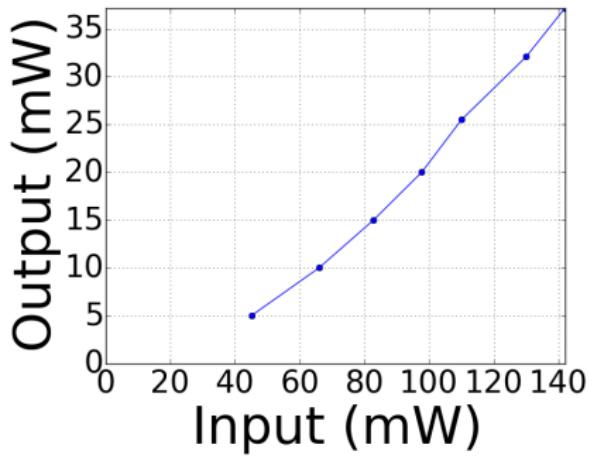
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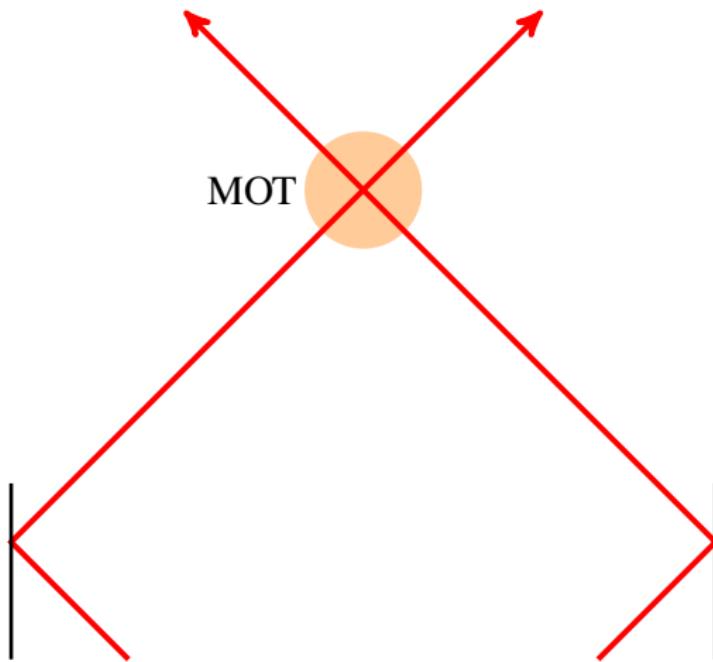
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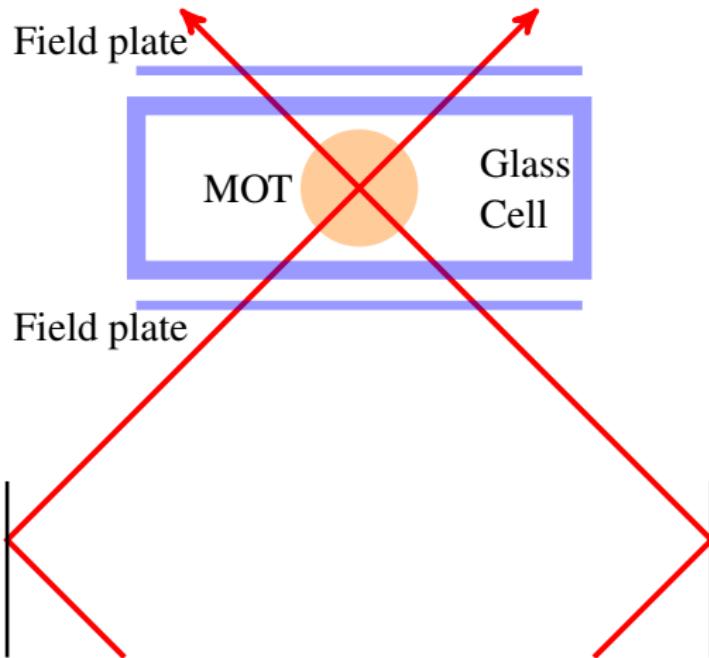


MOT stability



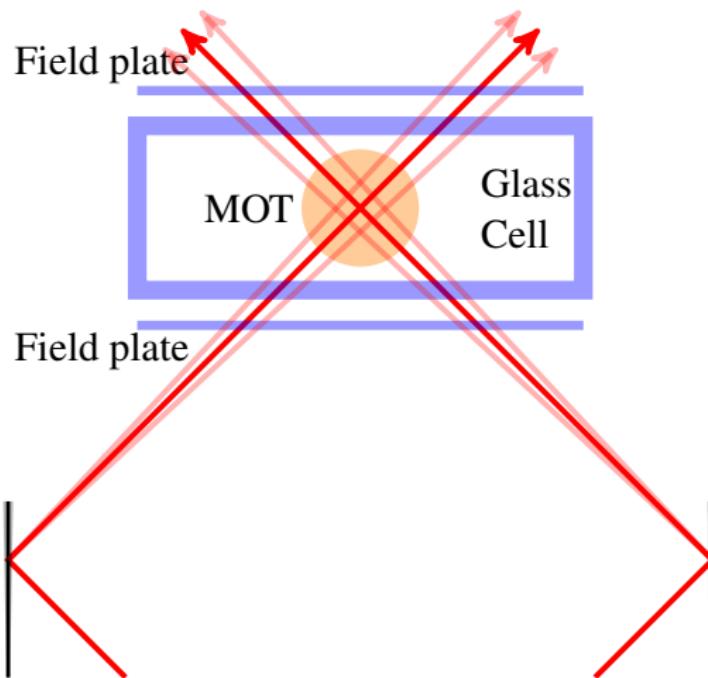
- MOT beam path
- Interference and stability
- Modulating the MOT beams
- Performance

MOT stability



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MOT stability



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Members