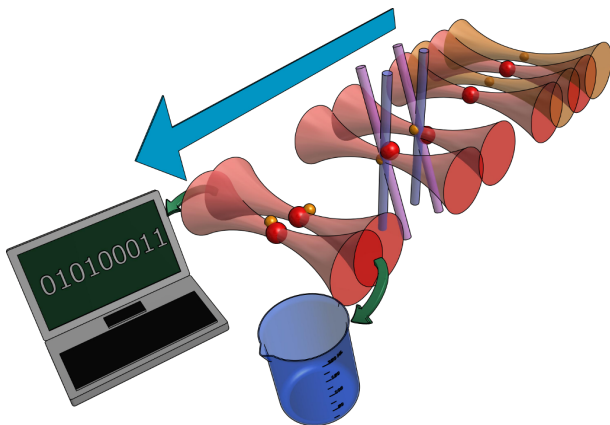
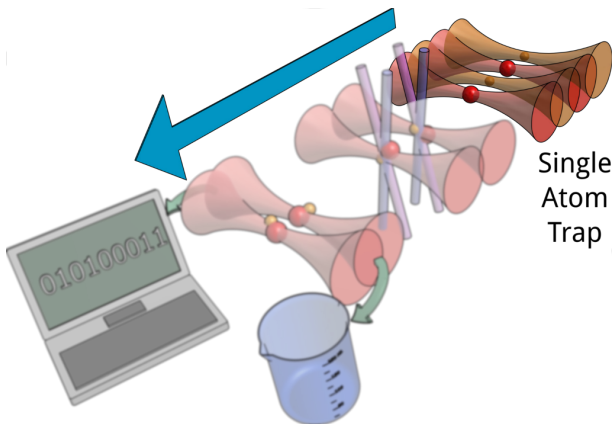


Apparatus for making dipolar NaCs molecules



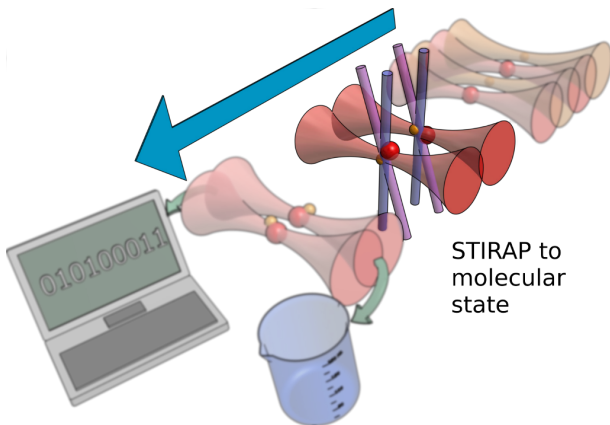
Yichao Yu
May 3, 2015
Harvard/Ni Group

Apparatus for making dipolar NaCs molecules



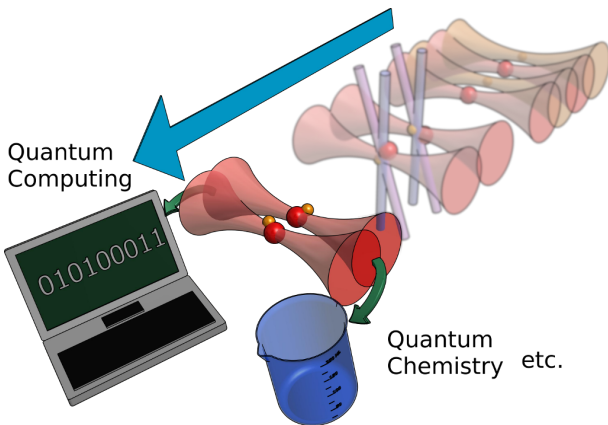
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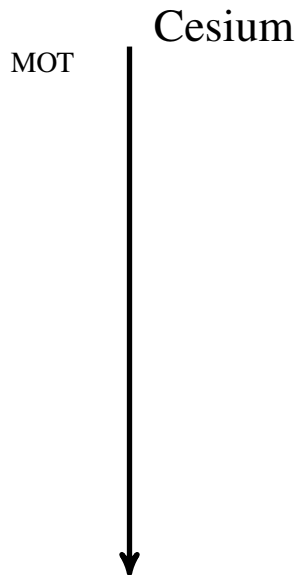


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Cesium



Current state

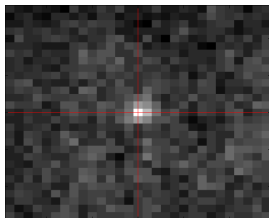


Current state

Cesium

MOT

Trapping
single
atom



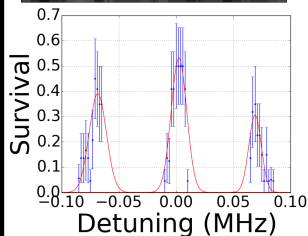
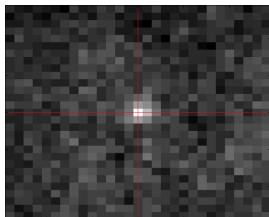
Current state

Cesium

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single
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Single
atom
cooling

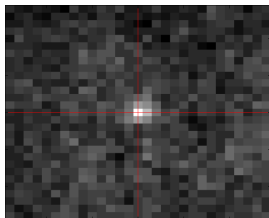


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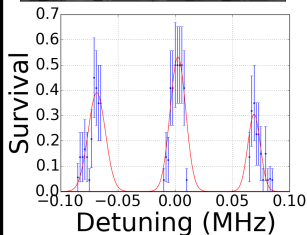
Cesium

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Sodium

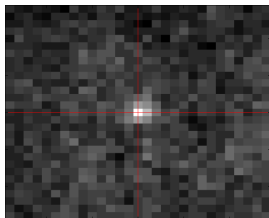


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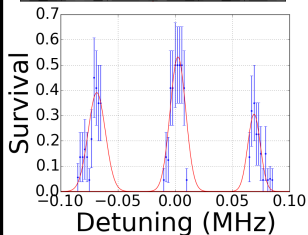
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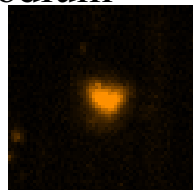


Single
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Sodium

MOT

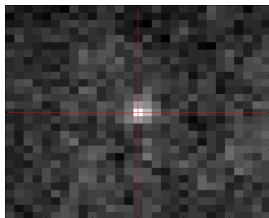


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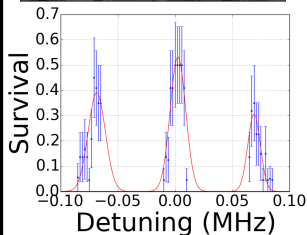
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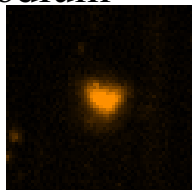
Single
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Sodium

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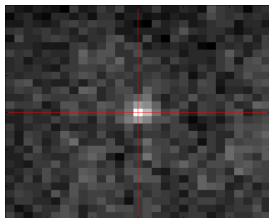


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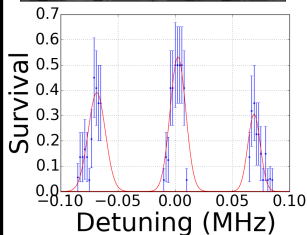
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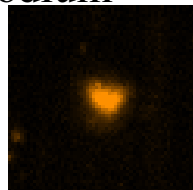
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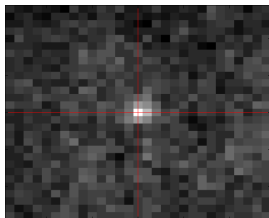
- Sodium laser
- MOT stability

Current state

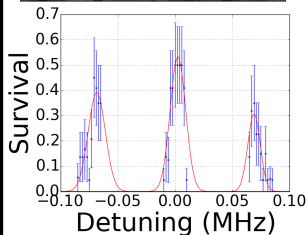
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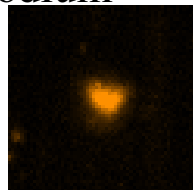
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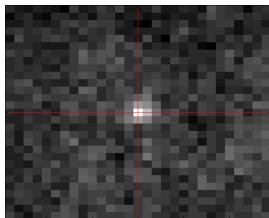
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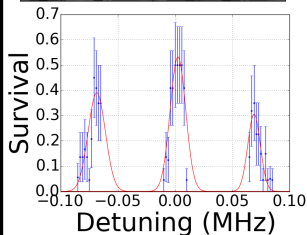
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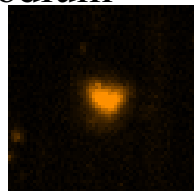
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Problems

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Laser system for Sodium

Sodium wavelengths

- D lines $\approx 589\text{nm}$
- D2 line (Cooling, Imaging)
- D1 line (Pumping, Cooling)
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Using diode laser

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

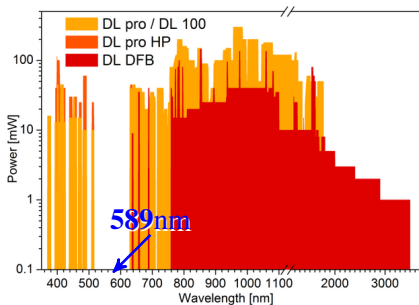
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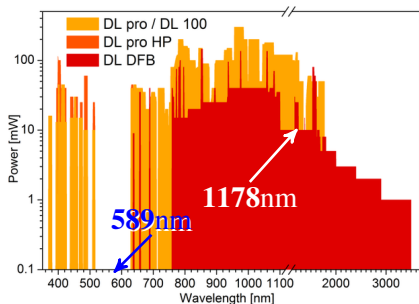
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$$589 \times 2 = 1178\text{nm}$$

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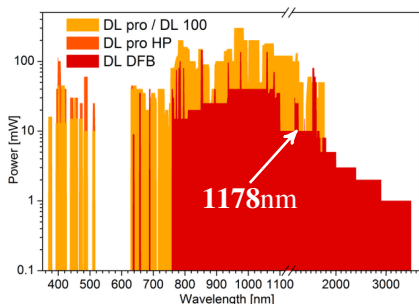
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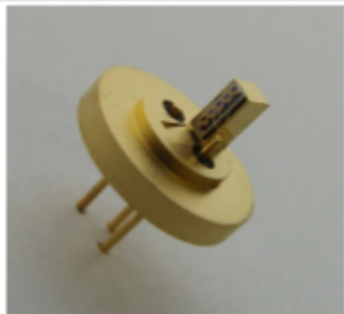
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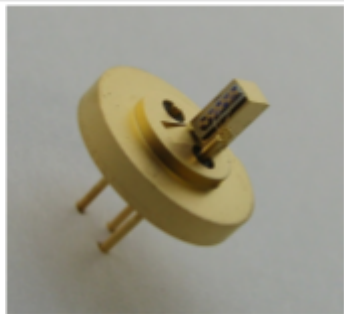
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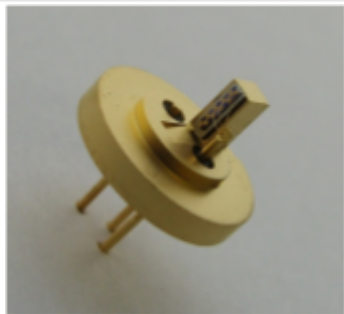
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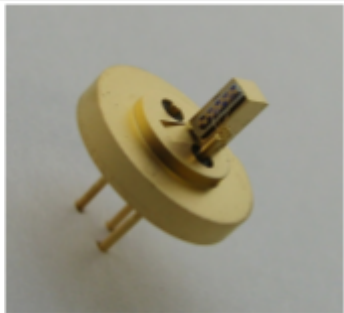
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- Interference and stability issue with a small MOT
- Modulating the MOT beams

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Members