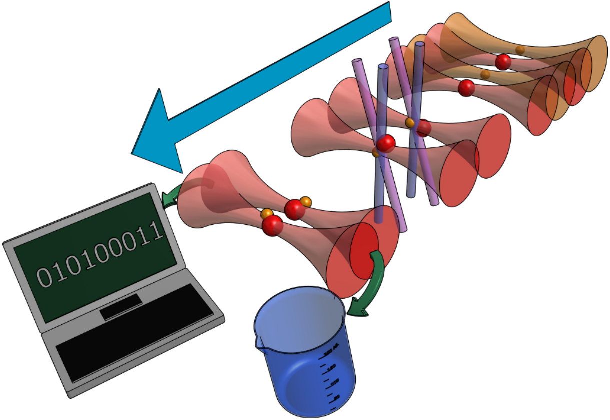
Trapping and imaging of single atom in the present of light shift



Yichao Yu

May 26, 2016

Ni Group/Harvard

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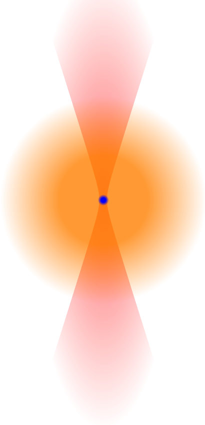

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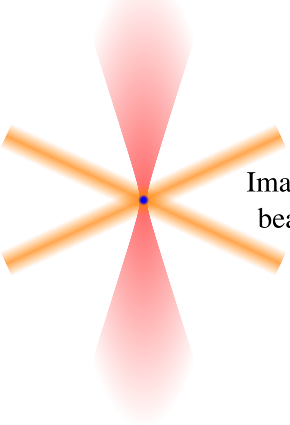

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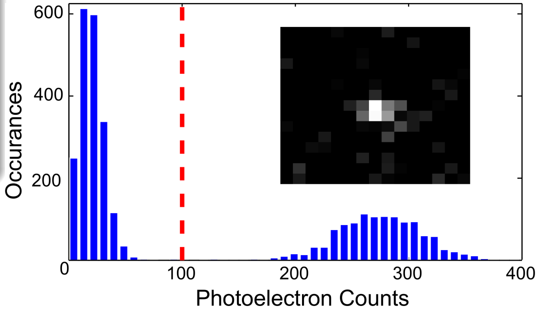

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Light shift

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- Inefficient cooling; Heating
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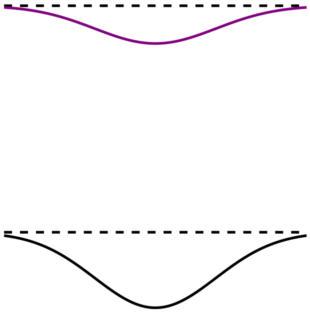

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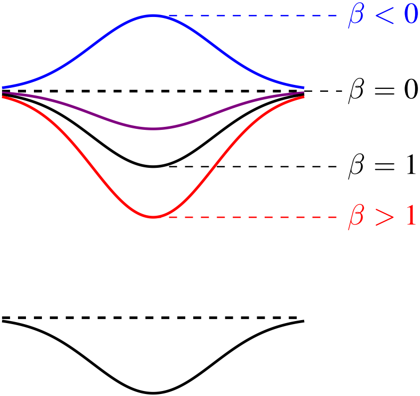

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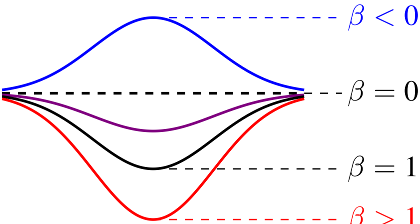

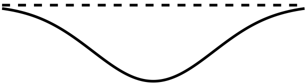

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λ_{trap}	922	935	970	700
β_{cycle}	2	1	0.6	-1

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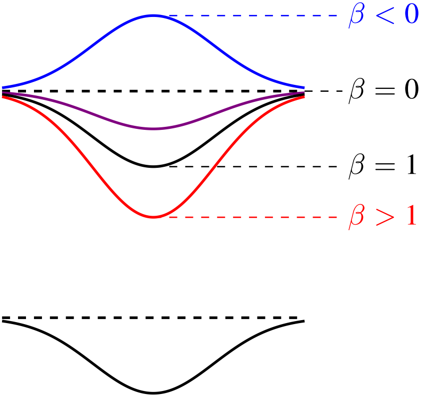

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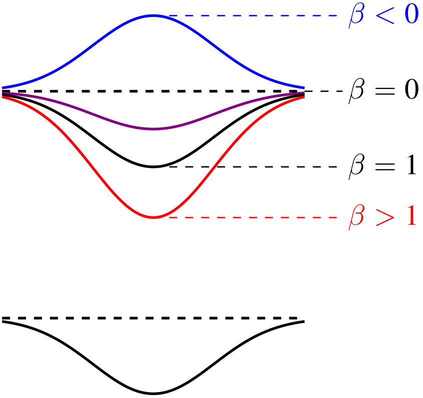

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Cs single atom loading

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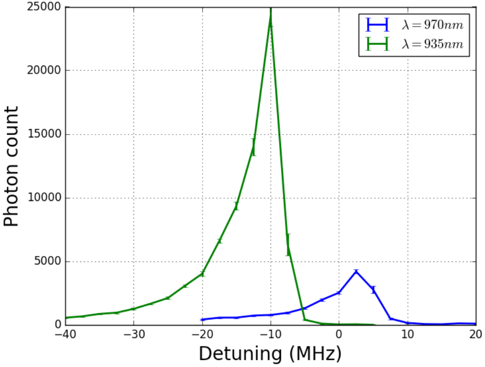
Loading	0	≈ 50	≈ 50

Cs single atom imaging



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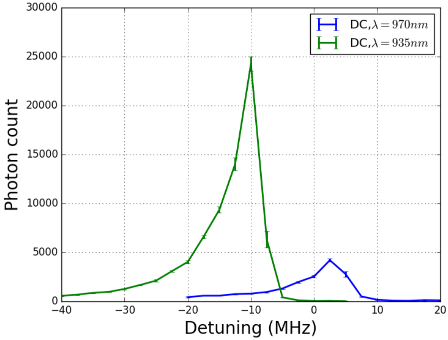

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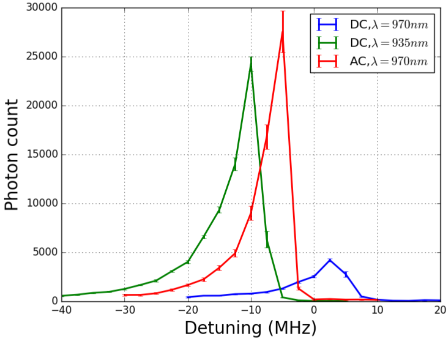

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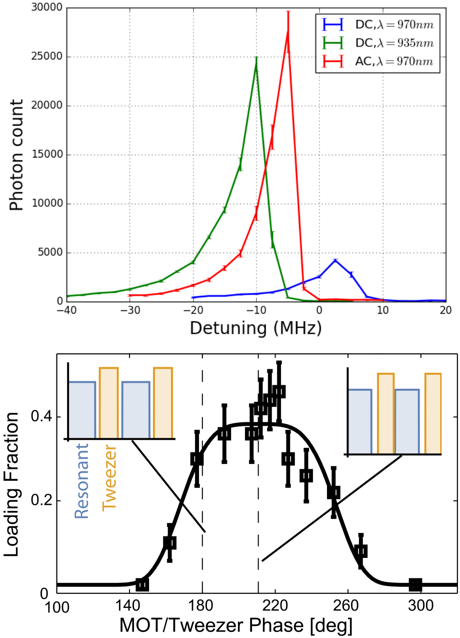

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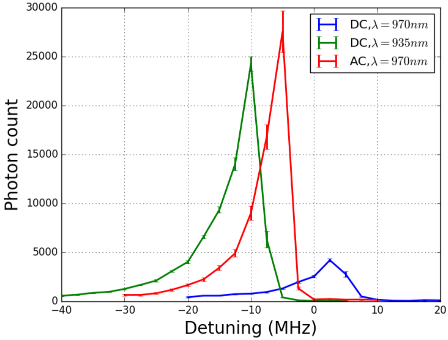

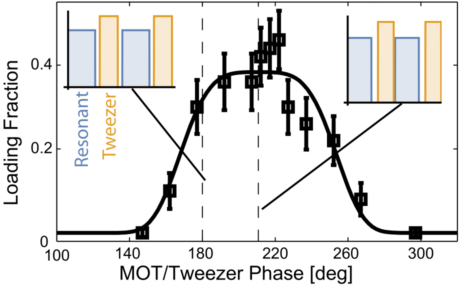

Conclusion

- Measured the effect of light shift on loading and imaging of single atom
- Overcome the light shift by alternating trapping and resonant light to achieve loading of single Na atom.