Creating a Novel Cold-Flux Atom Source

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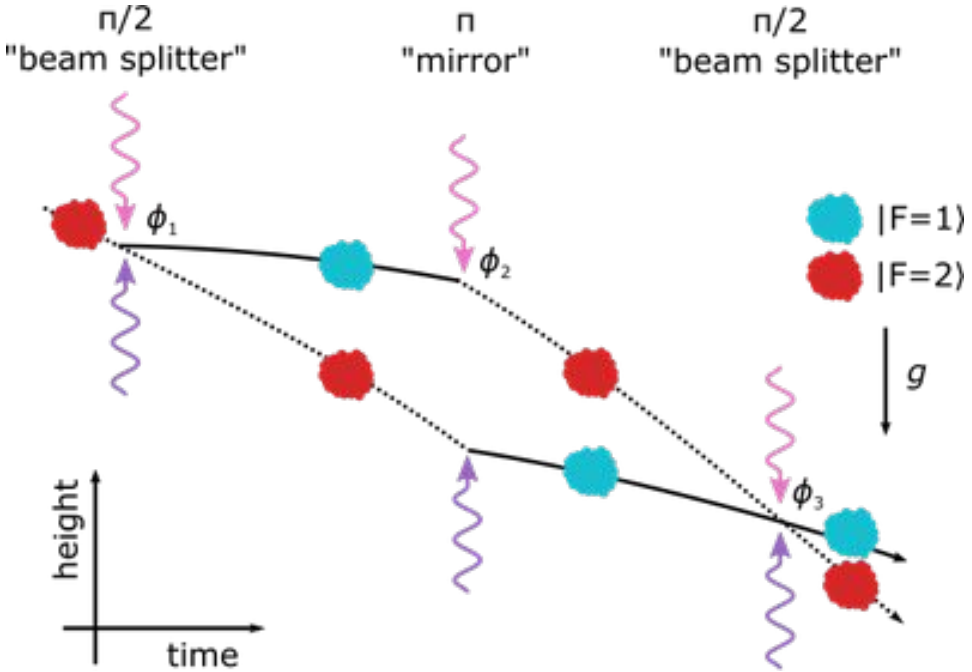
The Basics

- Atoms are prepared in superposition of states, creates an interferometer
- Laser pulses replace physical optics
- Interferometer sensitive to new physics



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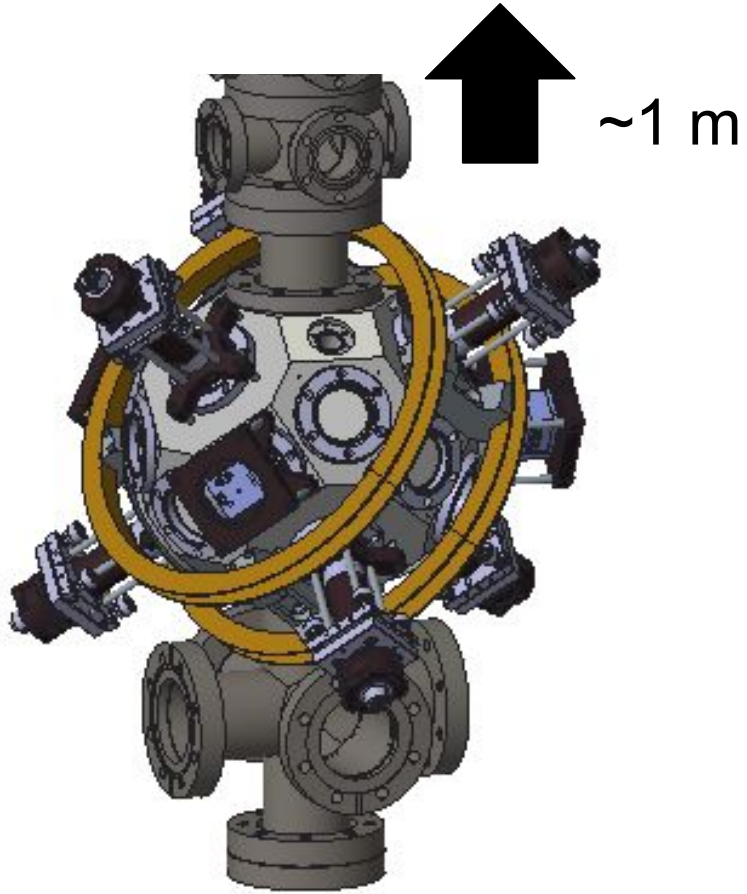
Interferometer Upgrade

- Many ways to improve readings
- Upgrade in progress to address several of these factors
- Focus has been on reducing MOT loading time and designing magnetic shim coils for atom trapping volumes
- Coil design has to fit around existing geometry, current limit restrictions



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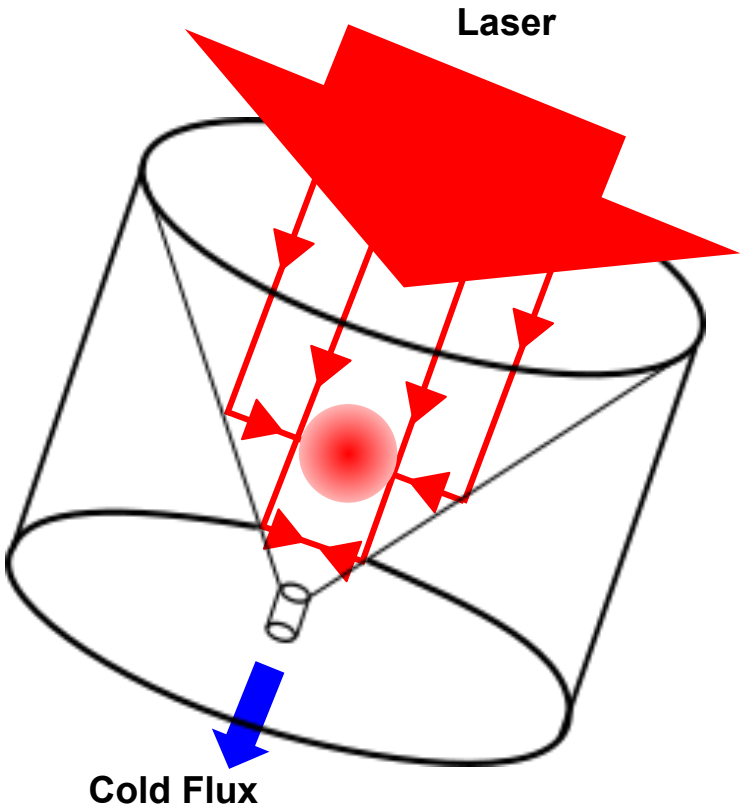
Conical MOT Source

- Conical mirror trap source does the work to cool a MOT outside the interrogation region
  - Improves loading time, reduces background
- Novel application
- Designed and began construction



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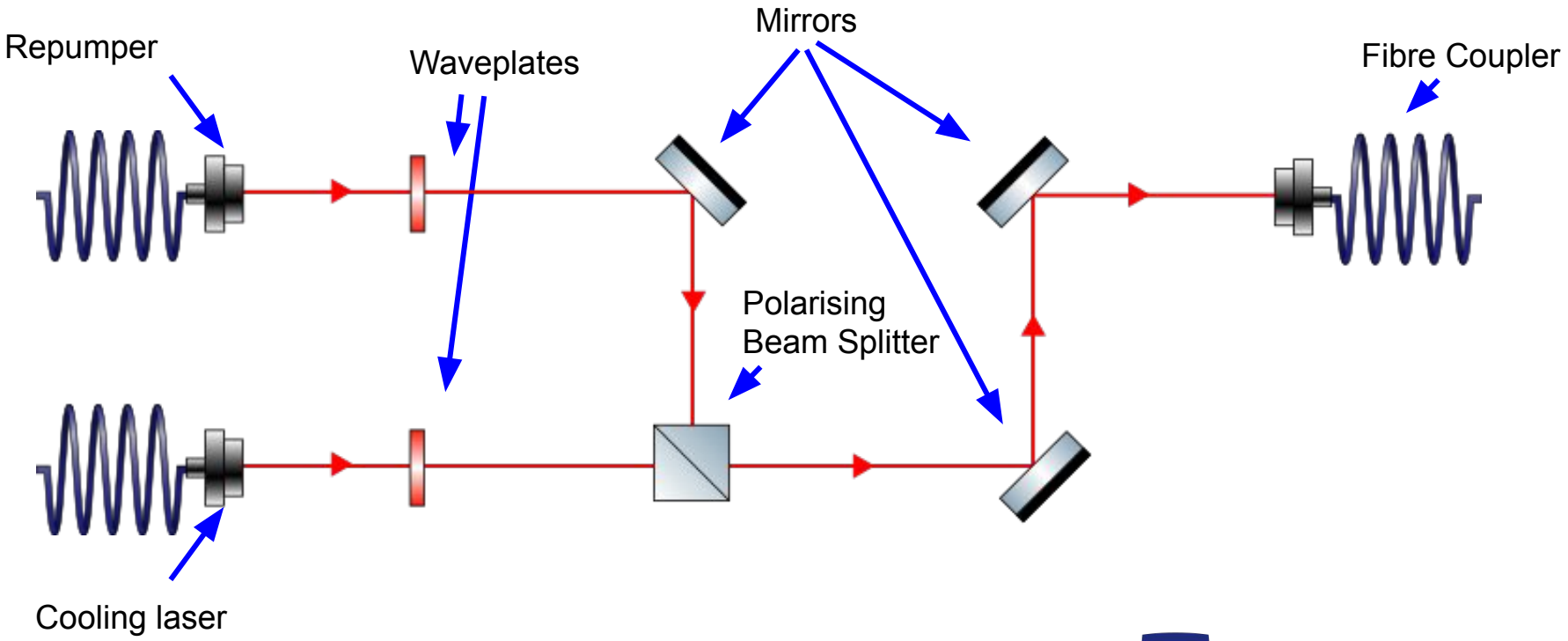
Old Laser System



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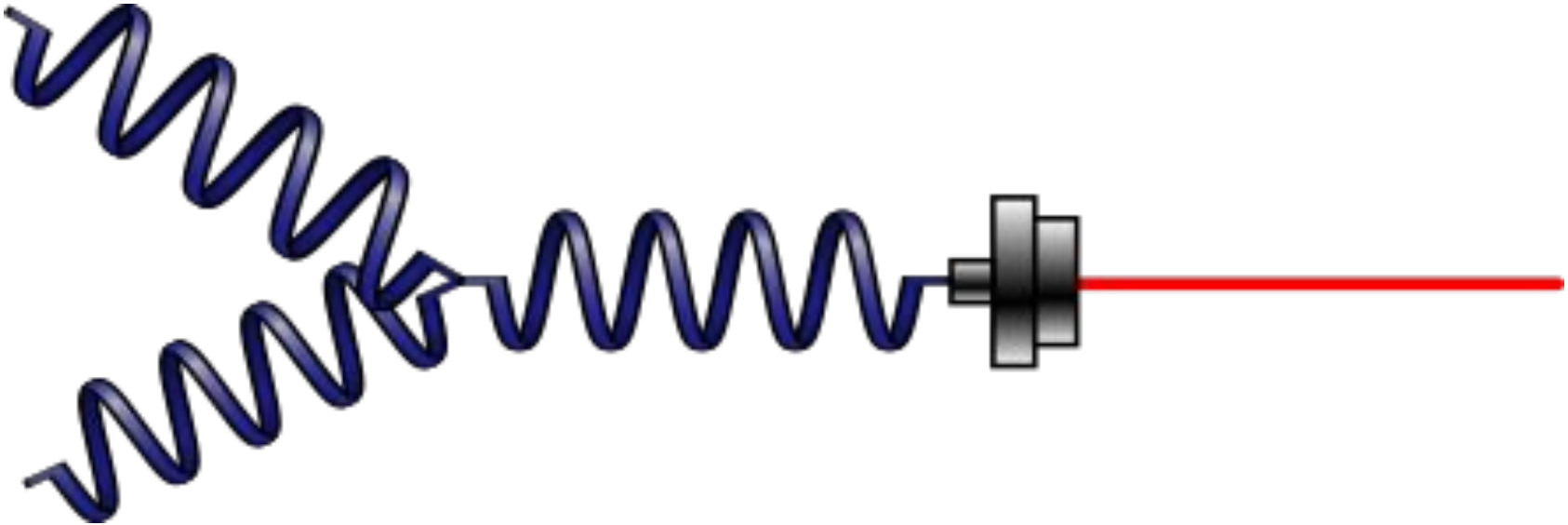
New Laser System



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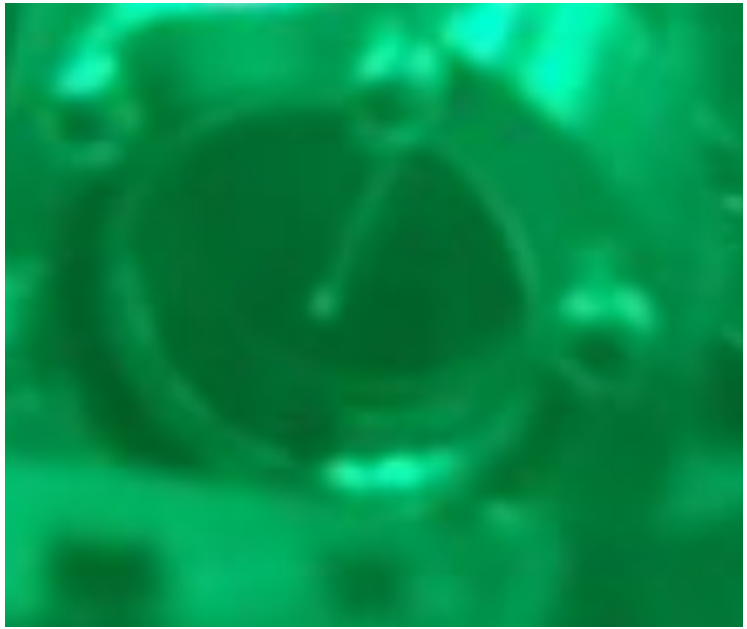
Getter Conditioning & Fluorescence Tests

- With new rubidium source, verified clear fluorescence image
  - Compared with saturated absorption spectrum reading corresponding to reference cell
- Looking to produce MOT
- Opportunity to characterise flux of new source, determine degree of improvement



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Questions?