GammeV Chameleon Afterglow Search

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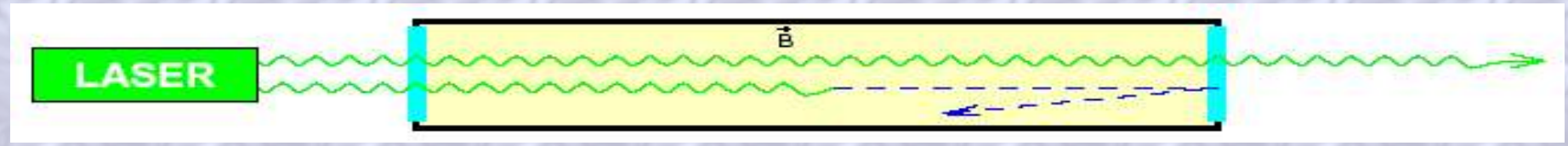
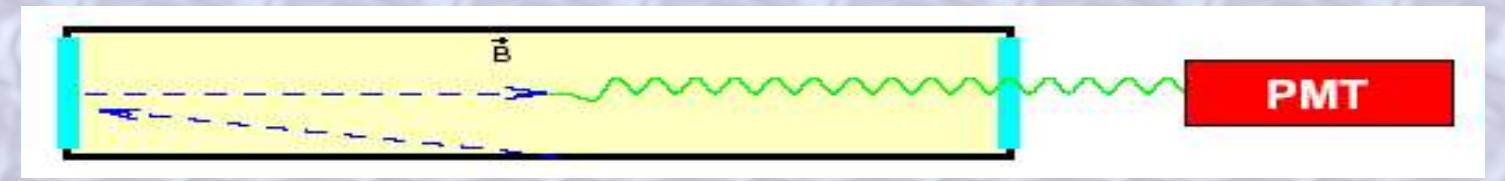
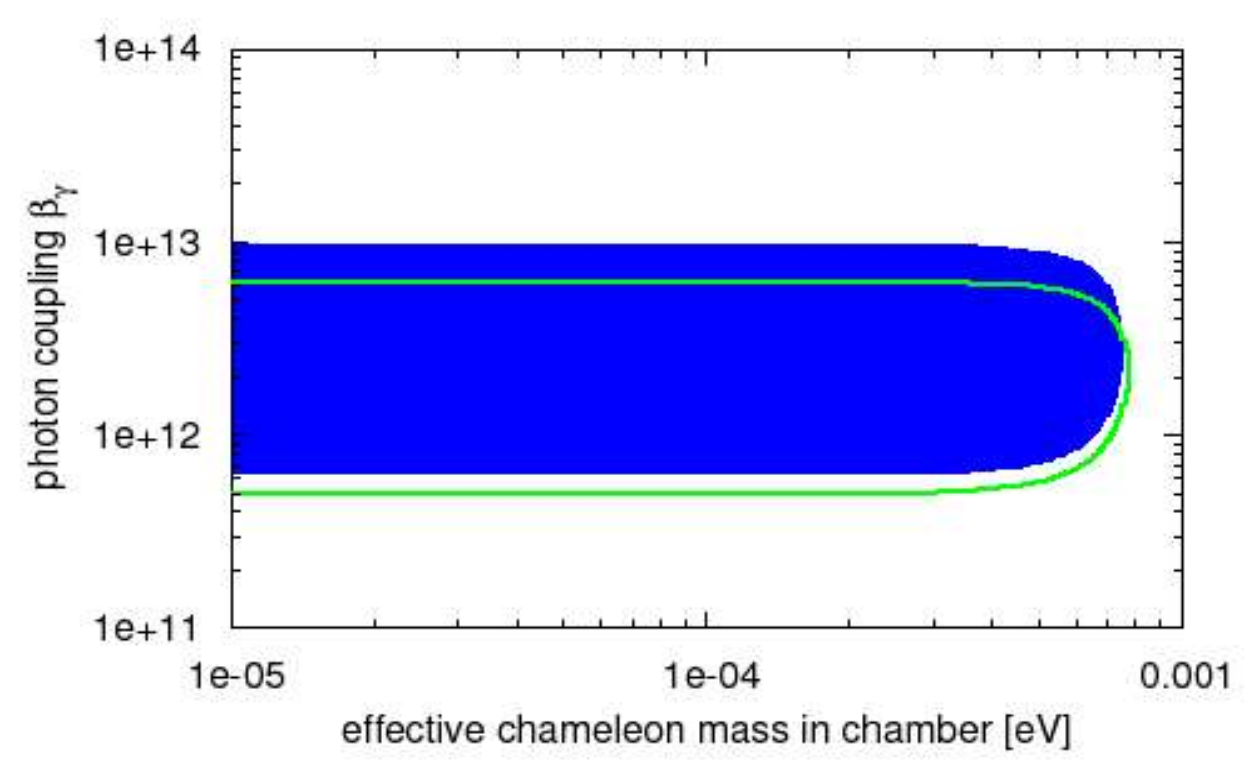
Chameleon Primer

- Scalar particle whose mass depends upon environment ($m_{eff} \sim \rho^{\alpha}$)
- Small mass in intergalactic space
  - Could give rise to observed acceleration of the universe
- Large mass in laboratory or solar environments
  - Eludes detection from previous searches for scalar particles

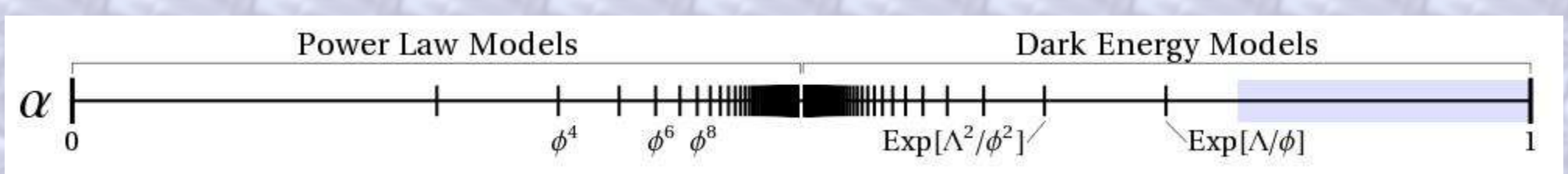




Original Results

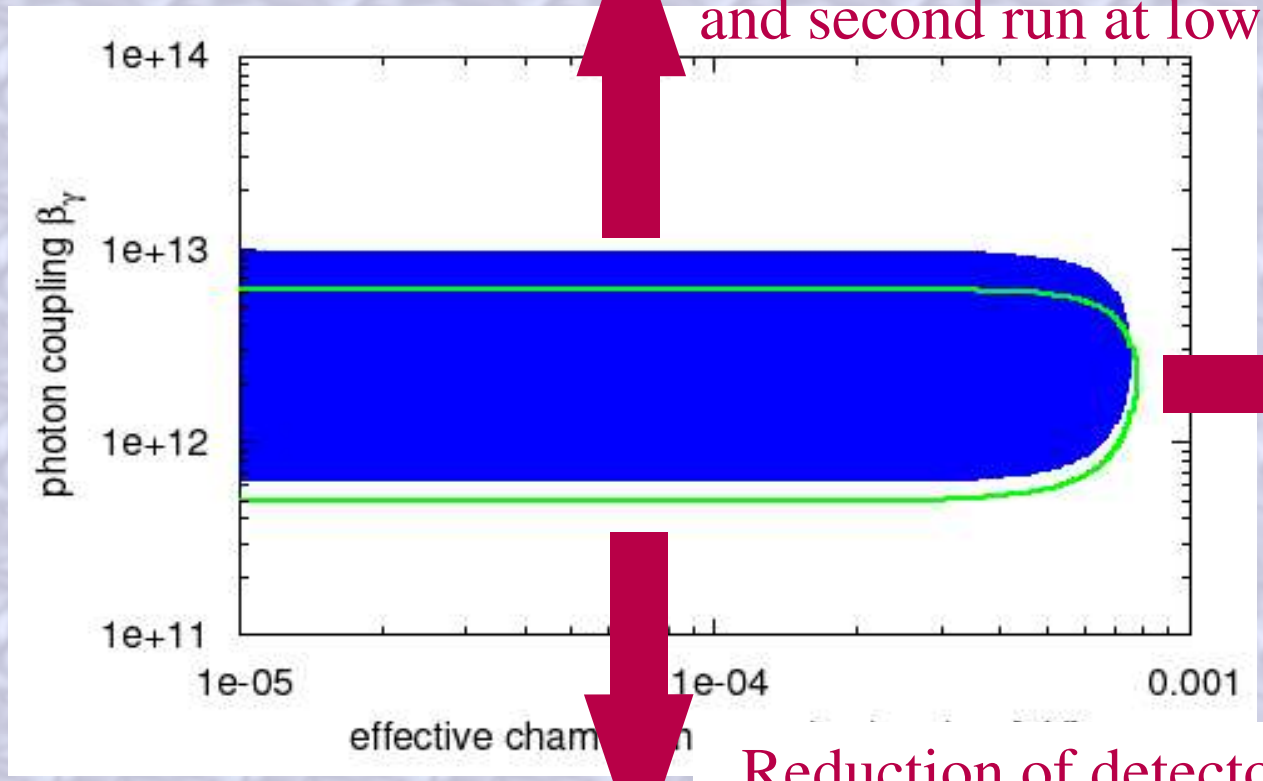


First laboratory search for photon-coupled chameleon particles.



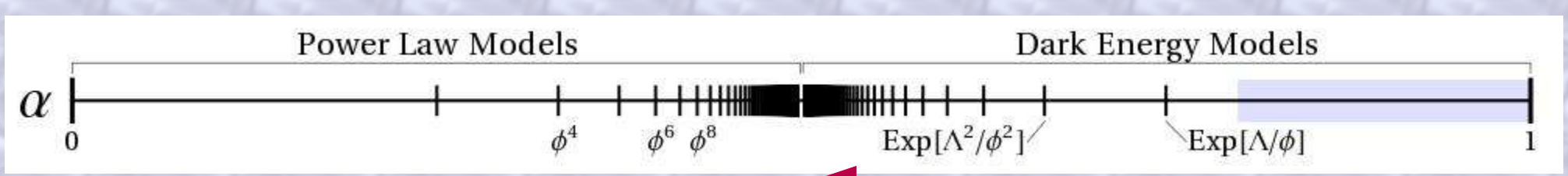
Original Results

Faster transition to data acquisition
and second run at lower magnetic field



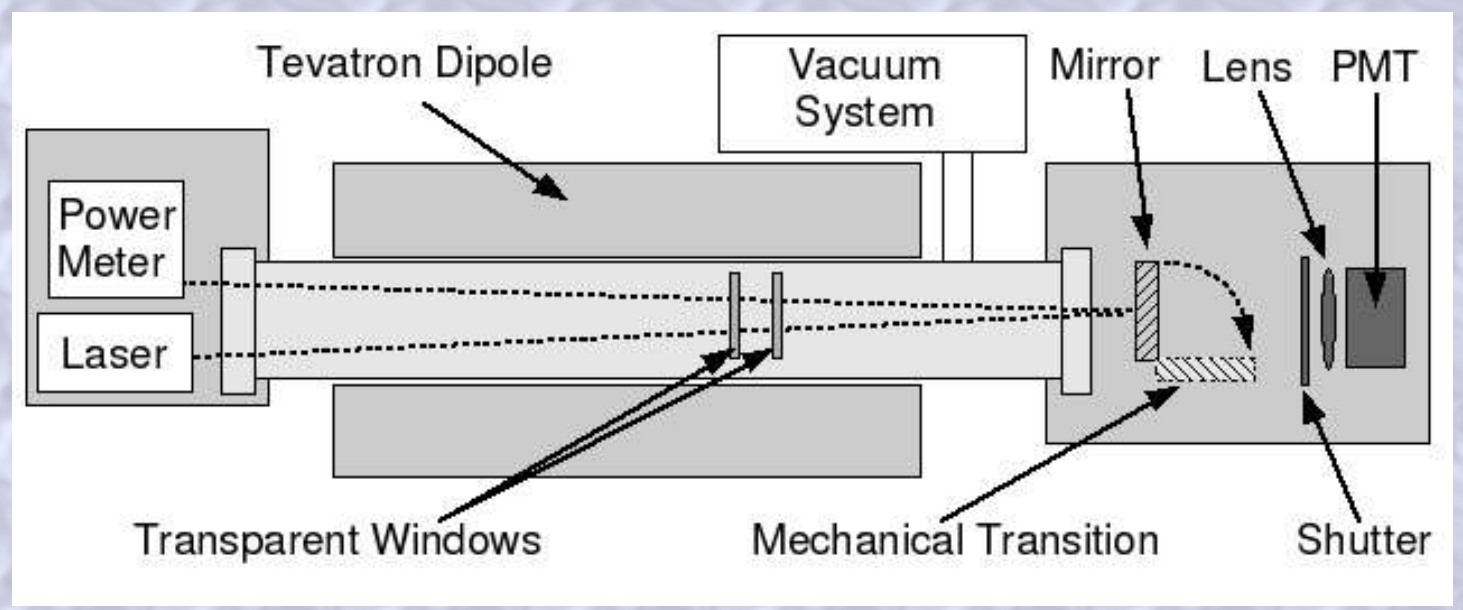
Shorter magnetic
field regions

Reduction of detector systematic uncertainty



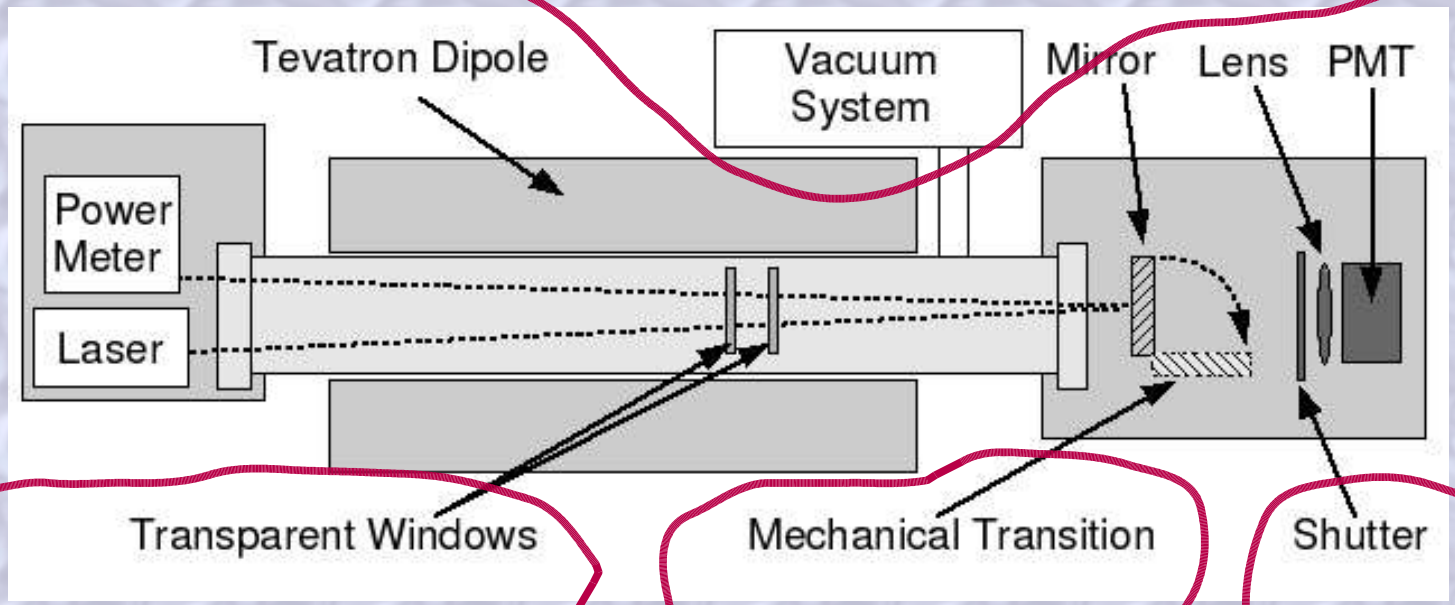
Improved vacuum system

Apparatus Overview



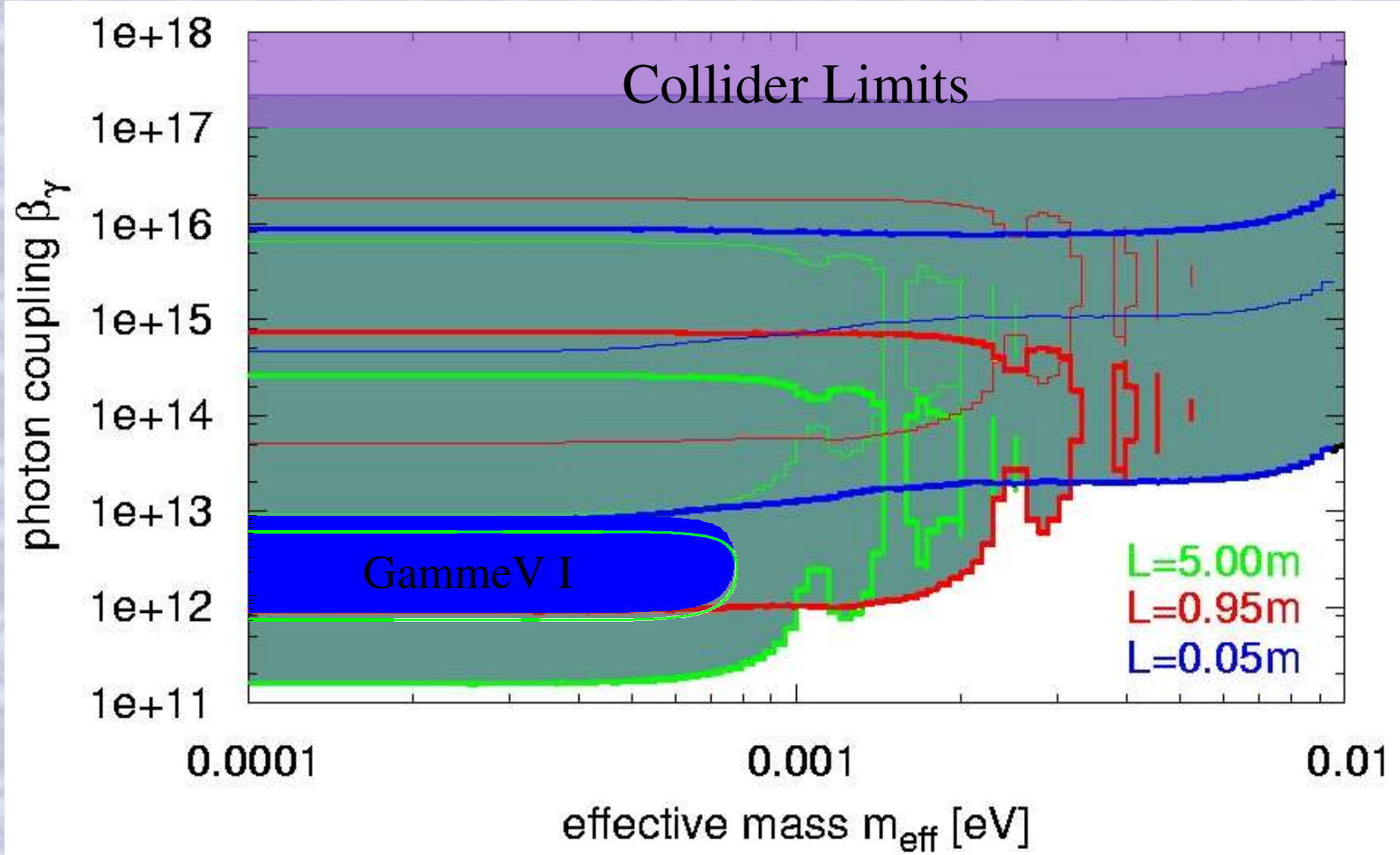
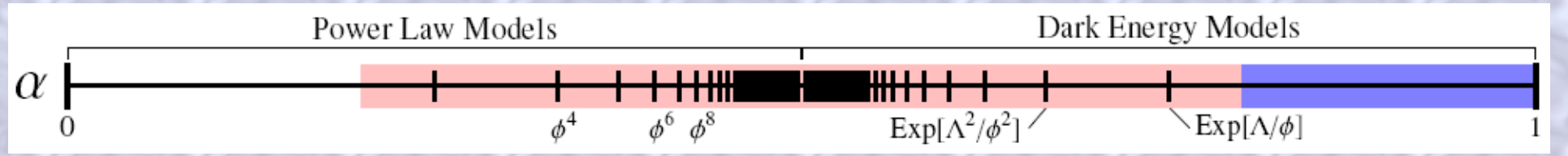
Apparatus Overview

Cryo-pump and ion pumping systems



Partition the magnetic field

Faster transition to data acquisition

Subtract PMT systematic error

Anticipated Results