

A Search for Modulation in the CoGeNT Data

Mariangela Lisanti

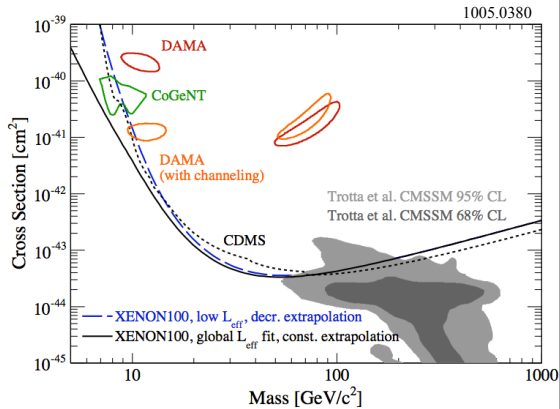
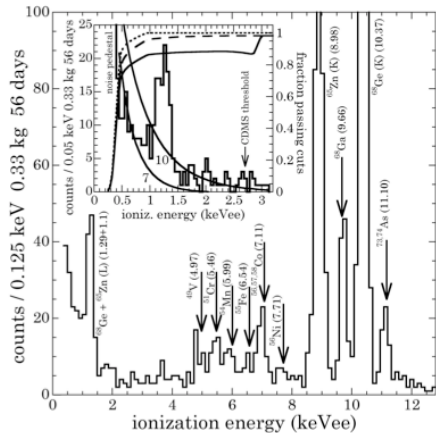
Princeton Center for Theoretical Science

w/Patrick Fox, Joachim Kopp, Neal Weiner

arXiv: very.soon

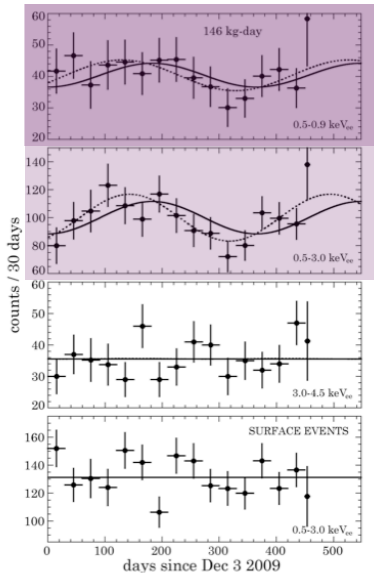
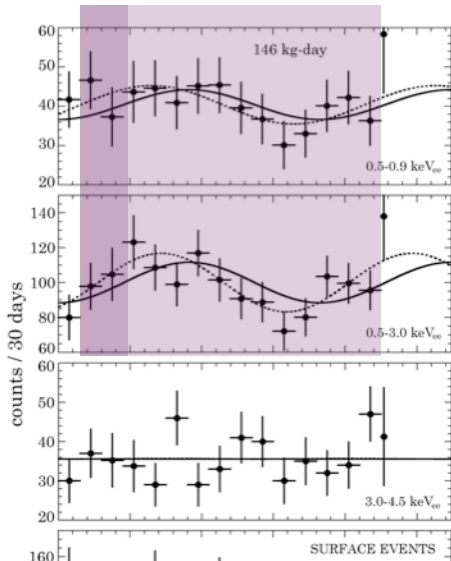
CoGeNT 2010

arXiv: 1002.4703



CoGeNT 2011

arXiv: 1106.0650



Outline

The Experiment & Data

Statistical Tools

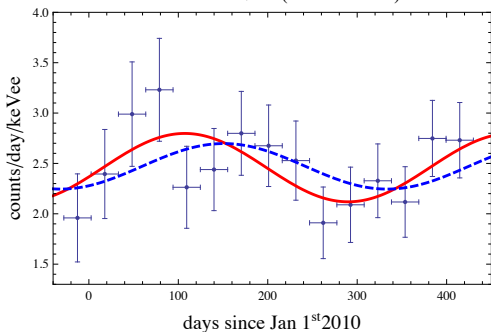
General Modulation Analysis

Dark Matter Interpretation

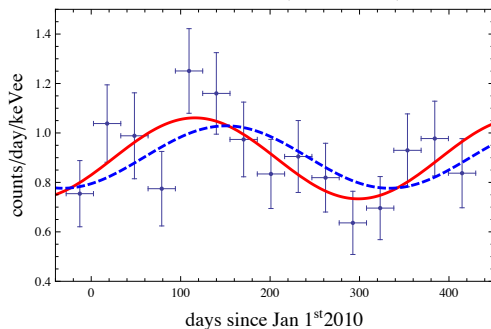
Binned Data

Preliminary

0.5 – 1.5 keVee (eff. corrected)



1.5 – 3.1 keVee (eff. corrected)



— Free Phase
- - - Maxwellian Phase

Outline

The Experiment & Data

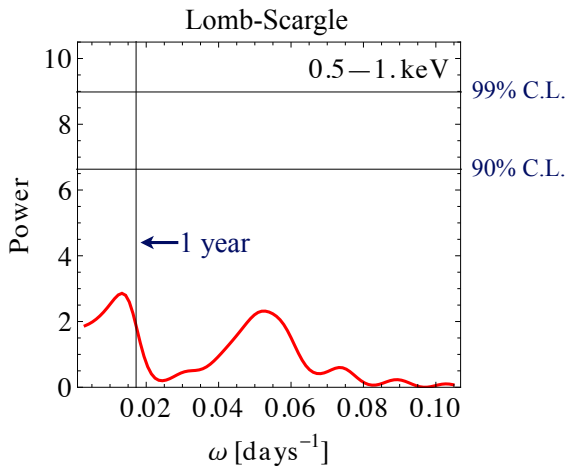
Statistical Tools

General Modulation Analysis

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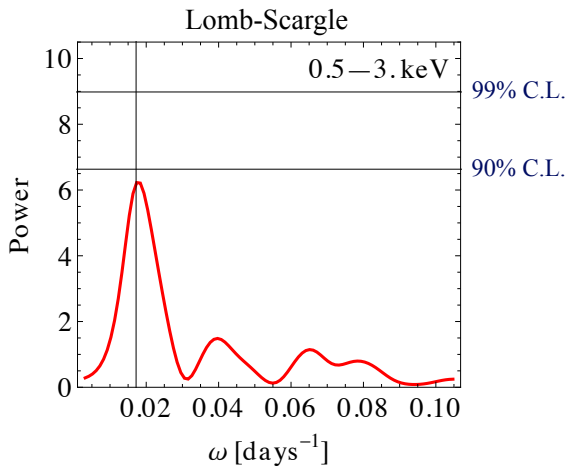
Oscillation Period

Preliminary



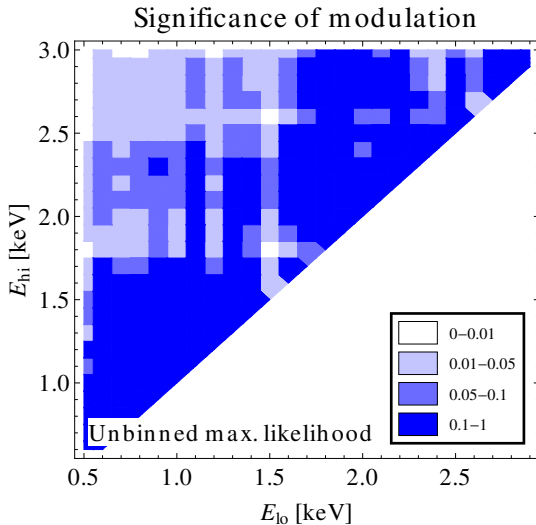
Oscillation Period

Preliminary



Significance

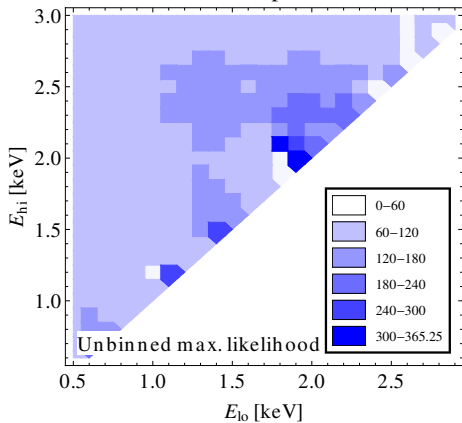
Preliminary



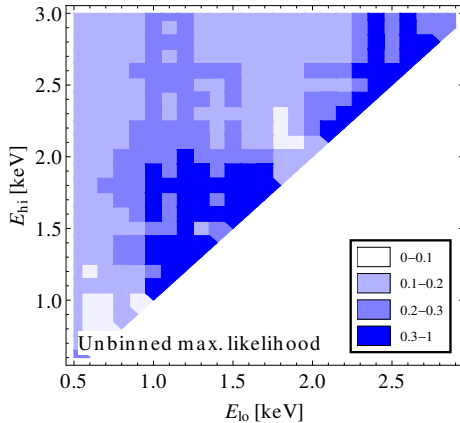
Phase & Amplitude

Preliminary

Best fit phase



Best fit modulation fraction

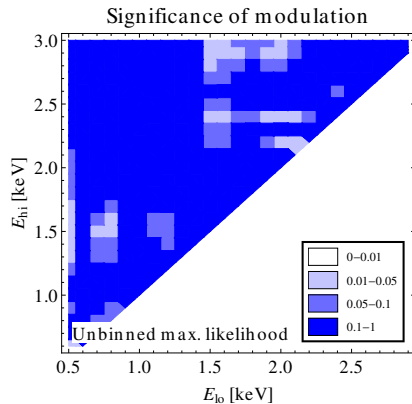
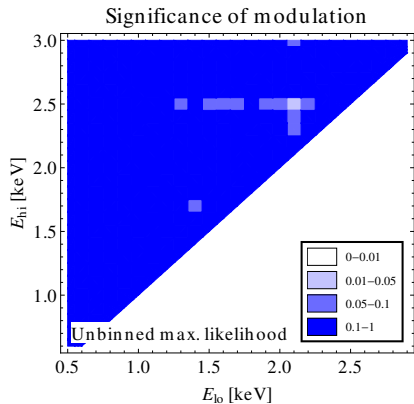


Daily Modulation

Preliminary

Solar Day (24 hrs)

Sidereal Day (23.93 hrs)



Outline

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Statistical Tools

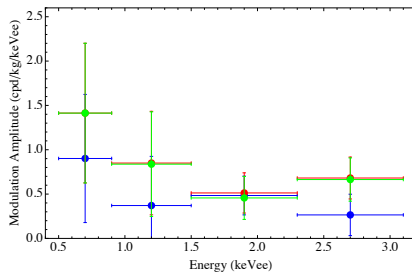
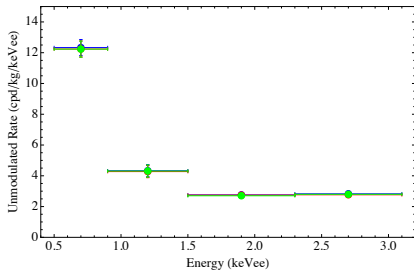
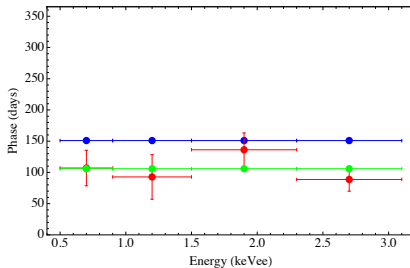
General Modulation Analysis

Dark Matter Interpretation

Low Energy Spectra

Preliminary

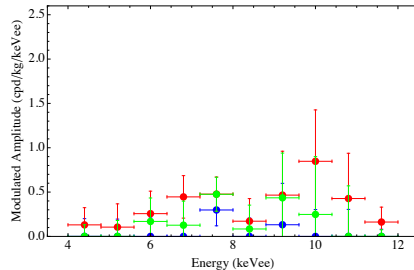
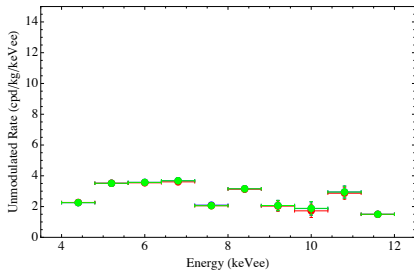
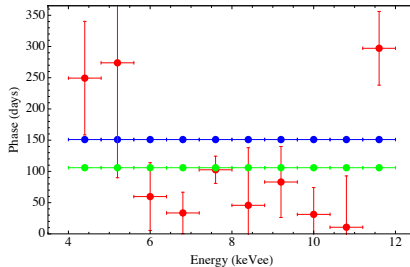
- Maxwellian
- Float
- Best-Fit



High Energy Spectra

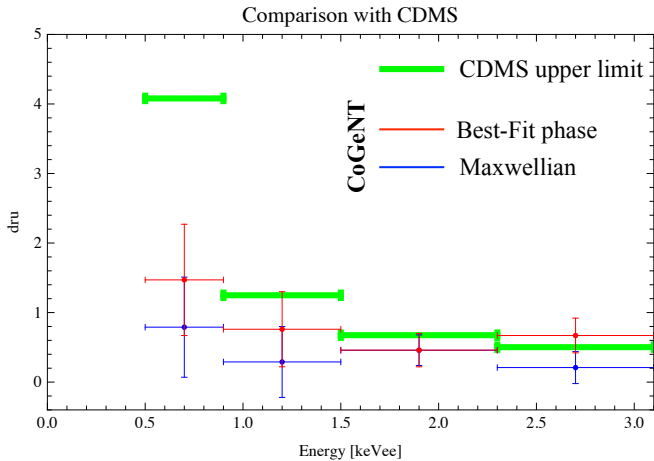
Preliminary

- Maxwellian
- Float
- Best-Fit

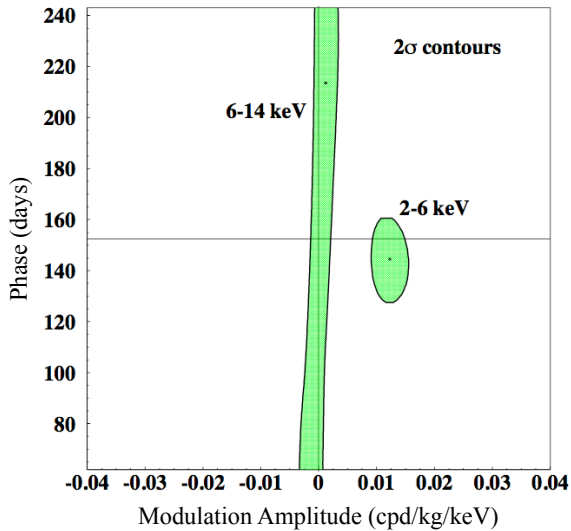


CDMS

Preliminary



DAMA



Summary

Preliminary evidence for annual modulation

Significant modulation from 1.5 keV and above

Difficult to reconcile with standard DM assumptions

If correct, CDMS should see nearly 100% modulation