

DAMIC : a Low mass WIMP($\sim < 5\text{GeV}$) detection project with CCDs

Tuesday, 9 June 2015 08:45 (15 minutes)

A large body of astronomical evidence across all length scales, from galaxy rotation curves, to lensing studies and spectacular observations of galaxy cluster collisions, to cosmic microwave background measurements, all points to the existence of CDM(Cold Dark Matter) particles. WIMPs(Weakly Interacting Massive Particles) represent a class of dark matter particles that froze out of thermal equilibrium in the early universe with a relic density that matches observation. Meanwhile, with a certain approximation, WIMPs could “naturally” solve the gauge hierarchy problem. This is the so called WIMP miracle.

Many theoretical models beyond the Standard Model provide natural candidates for WIMPs, but the range of WIMP mass is huge : from 1GeV to 100TeV.

DAMIC dedicates to hunt low mass($\sim < 5\text{GeV}$) WIMP thanks to its extremely low noise, $2e^-$ -(RMS).

In this presentation, I will introduce three aspects :

0), Making a brief review on the work our collaboration have achieved;

1), Introducing the quenching factor measurement for silicon which has been finished in University of Notre Dame, IN.

2), Showing very preliminary progress of DAMIC data analysis using EFT(Effective Field Theory) which is supposed to be a very attractive model to interpret the interaction of DM and baryonic matter.

DAMIC is an international collaboration. DAMIC detector has taking data since 2013 in Snolab, Canada.

Primary author: LIAO, Junhui (University of Zurich)

Presenter: LIAO, Junhui (University of Zurich)

Session Classification: Session 5 - Astrophysics and the Dark Sector