

Breve report - Dark Sector 2016 workshopPADME

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3-Maggio-2016

INFN Lecce

4 working group

- Dark matter at accelerator
- Visible dark photon searches
- Rich dark sector
- Direct detection low mass dark matter

Dark matter at accelerator

Broad international program to probe LDM with accelerators is really taking off. Many excellent and important opportunities on the 5 year horizon.

Fixed-Target:

MiniBooNE @ FNAL
DUNE / LBNF @ FNAL
SeaQuest @ FNAL
SHiP @ CERN
Daedalus
BDX @ JLAB or SLAC
Mainz beam dumps
DarkLight

LDMX @ SLAC or JLAB

NA64 @ CERN

MMAAPS @ Cornell

VEPP-3

PADME @ LNF

Colliders:

LHC @ CERN

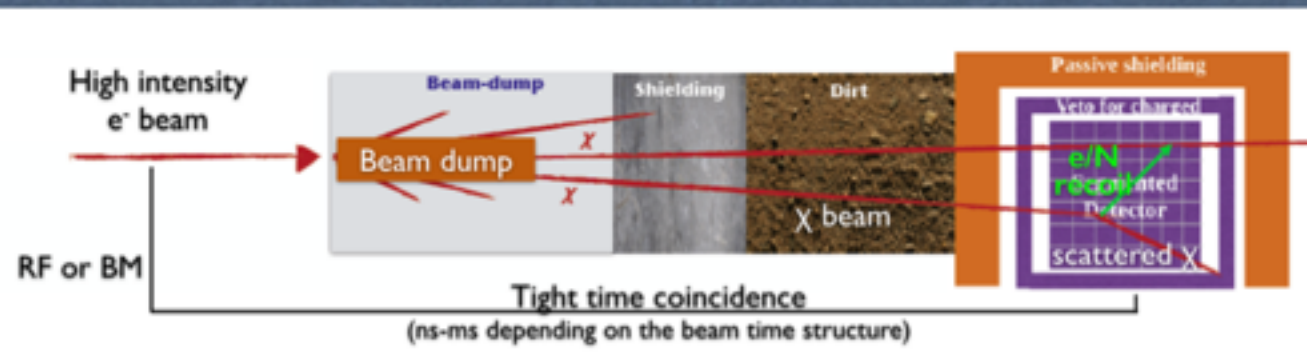
Belle II @ SuperKEKb

KLOE, NA62

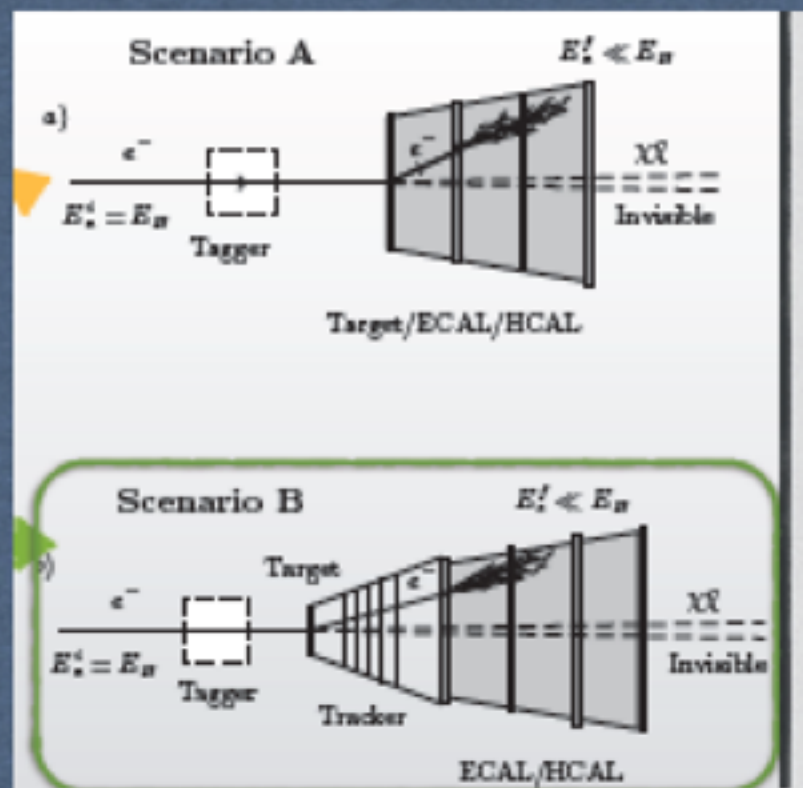
...and other experiments

Dark matter at accelerator

Three different techniques in Invisible search



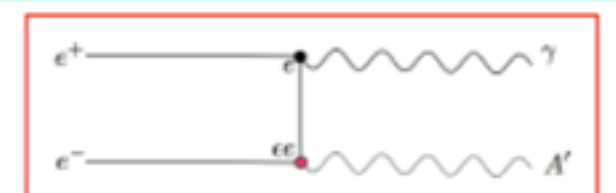
- Beam dump



- Missing momentum

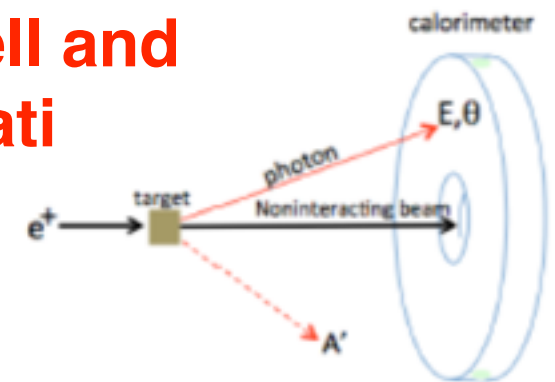
- **Missing Mass**

Process of interest:



MMAPS@Cornell and PADME@Frascati

Hardware:



Rich Dark Sectors (RDS)

1. Dark Sector Masses and Naturalness

Thursday, 4:30pm-6:00pm

Where do light masses come from?

Are they natural? Are there additional states to discover?

2. Exotics

Friday, 10:00am-11:30am

What should we look for beyond the minimal portals?

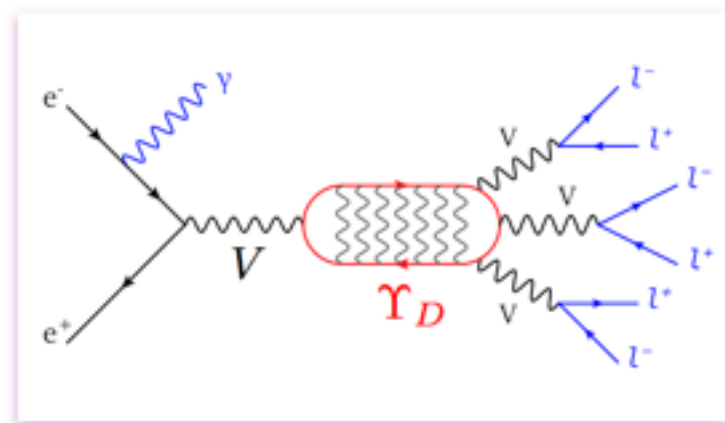
Are we missing any experimental opportunities?

3. Non-Minimal Dark Matter

Friday, 1:30pm-3:00pm

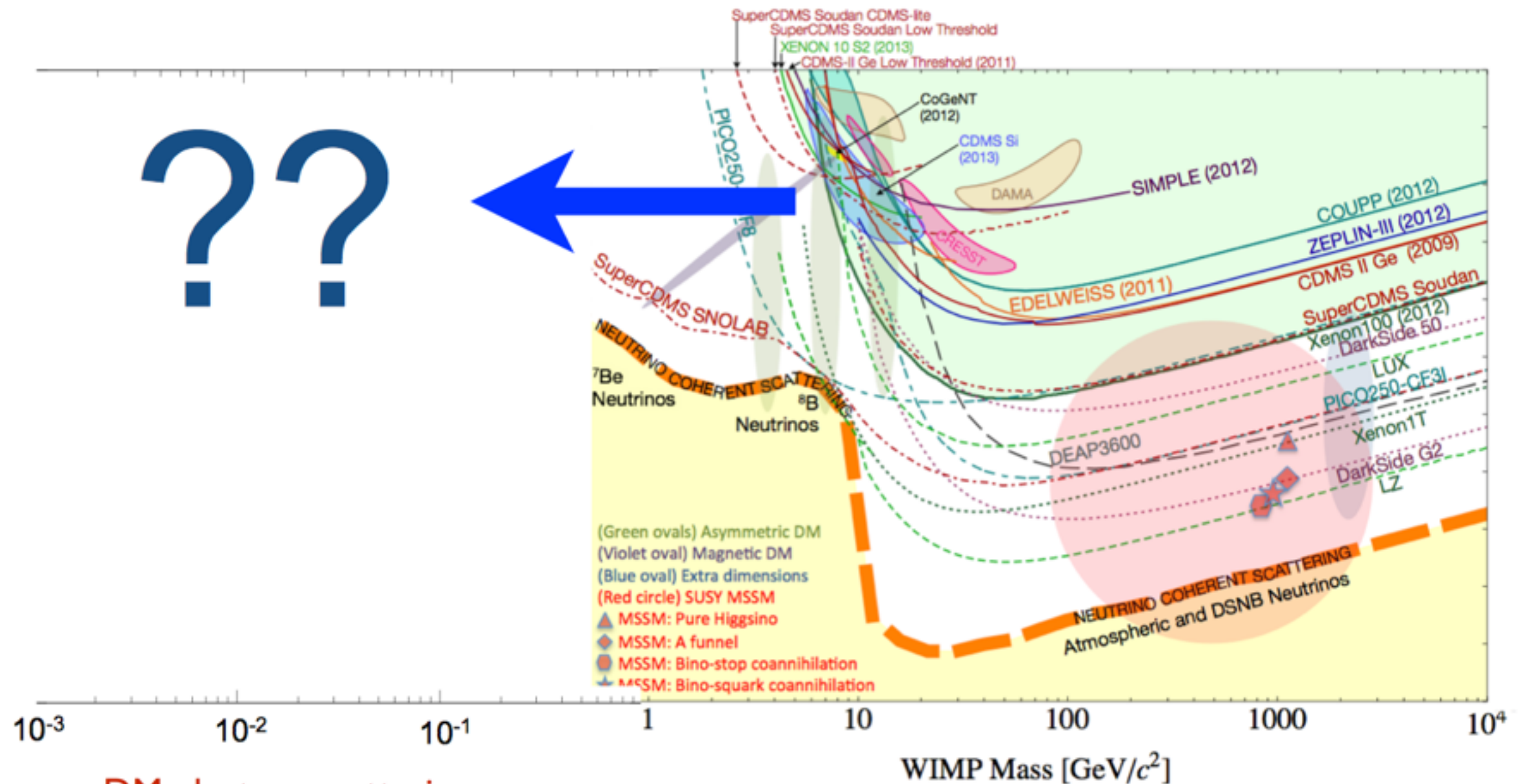
Is DM self-interacting/inelastic/excitable/asymmetric/...?

Are there ways to combine DM and other searches?



Darkonium resonance

Direct detection



DM-electron scattering



Low threshold
detector needed

Traditional Direct Detection strategy:
look for nuclear recoils from DM-nucleus scattering

