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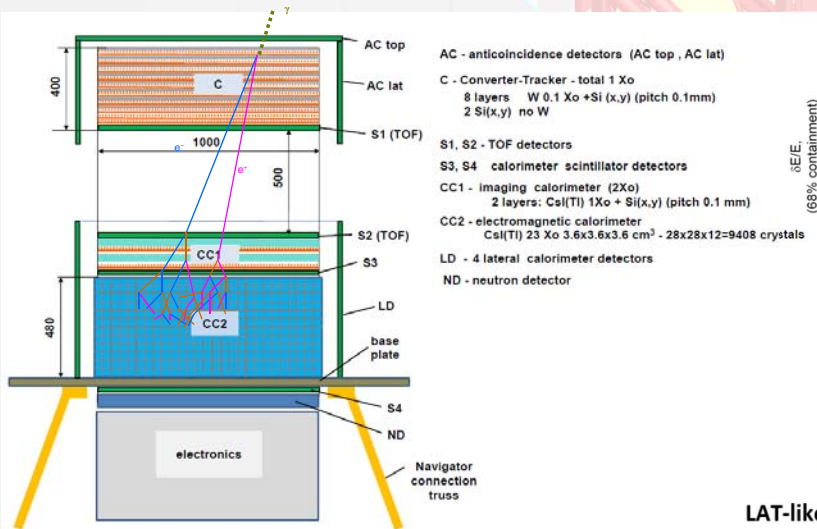
A.M. GALPER "THE GALACTIC CENTER IS THE MAIN GAMMA-400 GOAL TO SEARCH FOR DARK MATTER"

Galactic center of Milky Way ($b < 1^\circ, l < 1^\circ$) is the unusual, very interesting place, where the main directions of the Universe investigations are crossed: cosmology, relativistic astrophysics, extension of the standard model of high-energy physics (dark matter), processes of particle acceleration up to 10^{18-20} eV, etc. In the Galactic Center, there are the objects, observation of which are the aims for the different telescopes, including the "GAMMA-400" gamma-ray telescope: supermassive black hole, which mass is equal to $\sim 4 \times 10^6 M_{\text{Sun}}$; the region, where the density of dark matter exceeds average galactic (~ 0.3 GeV/cm³) approximately by a factor of 10^4 ; molecular clouds; regions with large number of millisecond pulsars; regions, where acts mechanisms of particle acceleration up to very high energy.

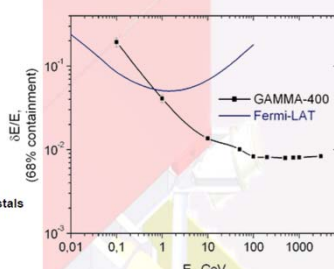
The high-energy gamma-ray observation (> 1 GeV) gives the unique information on the existence of supermassive black hole and accordingly accretion disc, which possibly consisting from dark matter. At present, they are one point object, but, from accretion disc, linear gamma rays from self-annihilation and decay dark matter particles should be observed.

In order to resolve this linear gamma-ray emission on the background of other emission sources in the Galactic center it is necessary to have very high angular and energy resolutions. The GAMMA-400 gamma-ray telescope has both the best angular and energy resolutions.

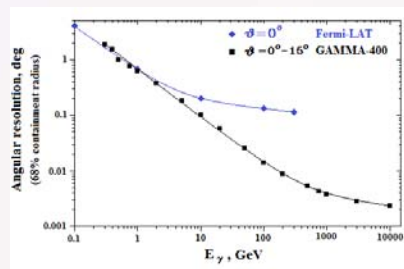
GAMMA-400 PHYSICAL SCHEME



THE GAMMA-400 PERFORMANCE



Angular resolution vs. energy for Fermi-LAT (for normal incidence) and GAMMA-400 (for $\theta=0^\circ-15^\circ$)

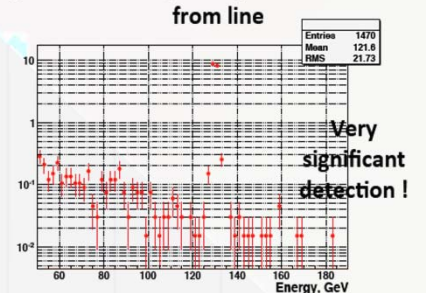
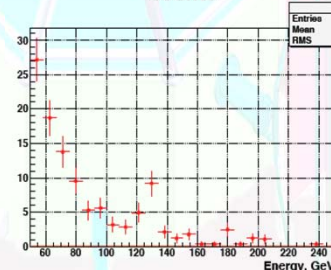


Energy resolution vs. energy for normal incidence for Fermi-LAT and GAMMA-400

Increasing the energy resolution

Gamma-400, 10X better dE/E, 10X better PSF (100X less background), same # of events from line

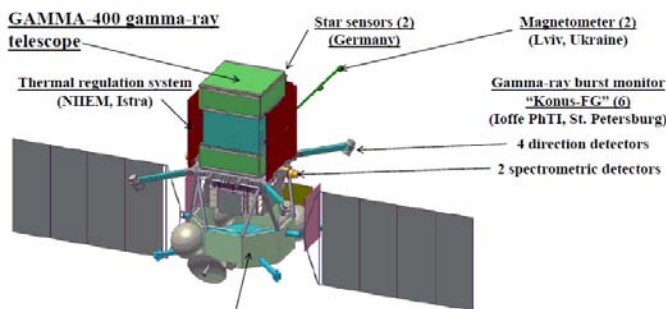
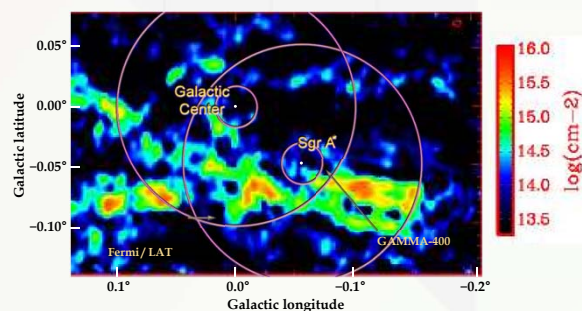
LAT-like instrument, 300 events



Alexander Moiseev, Aspen 2013 Closing in on Dark Matter

Demonstration of the GAMMA-400 possibilities when measuring direction

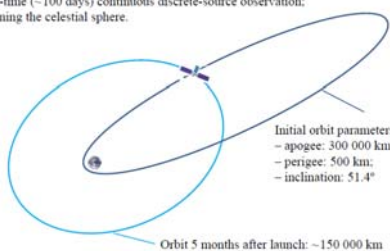
Background: Integrated intensity map of the NH₃ (1,1) emission (1.2652 cm wavelength) from [arXiv:1402.4531].
 Circles: point spread functions for Fermi/LAT (outer: 0.1° or 15 pc) and GAMMA-400 (inner: 0.01° or 1.5 pc) at $E_\gamma \sim 100$ GeV.



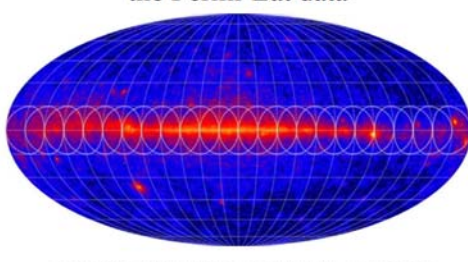
GAMMA-400 scientific complex on the Navigator service module

SURVEY MODES AND ORBIT EVOLUTION OF GAMMA-400

Survey modes without the Earth occultation:
 - long-time (~100 days) continuous discrete-source observation;
 - scanning the celestial sphere.



Gamma-ray sky map by the Fermi-Lat data



The GAMMA-400 observational program for first year in the Galactic scanning mode.

The GAMMA-400 launch date is the beginning of 2020s