

Particle Astrophysics in Poland

Report of Contributions

Contribution ID : 1

Type : **not specified**

Opening

Monday, 20 May 2019 09:45 (15)

Session

Contribution ID : 2

Type : **not specified**

Meeting of KRAC (closed)

Monday, 20 May 2019 17:30 (60)

Session

Contribution ID : 5

Type : **Poster**

Constraining the halo size from possible density profiles of hydrogen gas of Milky Way Galaxy

Galactic magnetic field (GMF) and secondary cosmic rays (CRs) (e.g. ^{10}Be , boron, antiproton) are important components to understand the propagation of CRs in the Milky Way Galaxy. Realistic modeling of GMF is based on the Faraday rotation measurements of various Galactic and extragalactic radio sources and synchrotron emission from CR leptons in the radio frequency range, thereby providing information of halo height. On the other hand, diffusion coefficient and halo height are also estimated from the $^{10}\text{Be}/^9\text{Be}$ and B/C ratios. Moreover, density distribution of gaseous components of interstellar medium (ISM) also plays an important role as secondary CRs are produced due to interaction of primary CRs with the gaseous components of ISM. We consider mainly molecular, atomic, and ionized components of hydrogen gas for our study. Recent observations and hydrodynamical simulations provide new forms of density profiles of hydrogen gas in Milky Way Galaxy. In the `\texttt{DRAGON}` code, we have implemented our chosen density profiles, based on realistic observations in radio, X-ray and γ -ray wavebands, and hydrodynamical simulations of interstellar hydrogen gas to study the variation in the height of the halo required to fit the observed CR spectra. Our results show the halo height (z_t) varies in the range of 2 to 6 kpc for the density profiles considered in our work.

Session

Cosmic Rays

Primary author(s): Dr BISWAS, Sayan (Raman Research Institute); Dr GUPTA, Nayantara (Raman Research Institute)

Presenter(s): Dr GUPTA, Nayantara (Raman Research Institute)

Contribution ID : 6

Type : **Poster**

Time variability of low angular momentum accretion flows around black hole.

Observations show the emission of hard and soft photons at high energies (X-ray or gamma ray) in the black hole accretion flow's spectra. These hard photons are observed at very high frequency which implies that they are produced near black hole horizon. As the quality and quantity of the high energy observations improved over the years, evidence mounted showing that photons must be created in a hot, tenuous, advection dominated region called the corona. This corona, boiling violently above the comparatively cool disk, is very close to the event horizon of the black hole. A relativistic fluid flowing into the black hole must have a varying adiabatic index rather than a constant one throughout the accretion disk.

Our recent work present the relativistic 2D simulation of such axisymmetric, inviscid, hydrodynamic accretion flows in a fixed Kerr black hole gravitational field. The flow is considered to have low angular momentum with respect to Keplerian one. In quasi-spherical, transonic accretion flow, occurrence and location of shock and sonic points depends on the parameters of the flow. Studying the evolution of this kind of flow with time shows oscillation of shock position in response to pressure against rotational force for some particular parameter space. I will talk about such oscillatory behavior of shock position and respective effect on mass accretion rate and frequency with varying adiabatic index. I will also discuss the relevance of our results with the observed phenomenon - QPO's (Quasi periodic oscillations) from galactic black holes and micro-quasars

Session

High Energy Astrophysics

Primary author(s) : Ms PALIT, Ishika (Center for Theoretical Physics of Polish Academy of science); Prof. JANIUK, Agnieszka (Center for Theoretical Physics of Polish Academy of science); Dr SUKOVA, Petra (Astronomical Institute, Czech Academy of Sciences)

Presenter(s) : Ms PALIT, Ishika (Center for Theoretical Physics of Polish Academy of science)

Contribution ID : 8

Type : **Poster**

Environmental dependence of properties of galaxies in Galaxy and Mass Assembly (GAMA) survey and its evolution using Marked statistics

Observed galaxies trace an underlying network of gravitationally dominant dark matter; we know however that they trace it in a biased way, and that this bias depends on galaxy properties. In many studies galaxy luminosity and/or galaxy stellar mass is used as a convenient (even if also biased) proxy of its host dark matter halo; in the same time it was also observed that clustering of luminosity-selected and stellar mass-selected samples is not identical, especially at higher redshifts (see Marulli et al. 2013; Durkalec et al. 2018), and these differences are quite complex. We use marked correlation function as a tool to study small-scale galaxy clustering weighted by these two properties. We present our first results from the study of the dependence of galaxy clustering on luminosity and stellar mass in the redshift range $0.1 < z < 0.5$ using 54262 galaxies from the Galaxy And Mass Assembly (GAMA) survey, covering a total area of 180 sq. deg. We measure the real space luminosity-marked and stellar mass-marked correlation functions for a set of volume-limited subsamples selected by the absolute magnitude and stellar mass. We present the results of a comparative study of both the properties with the aim to show how these two properties trace dark matter halo mass and local density field.

Session

Dark Matter and Dark Energy in Astronomical Measurements

Primary author(s) : Mr SURESHKUMAR, Unnikrishnan (Astronomical Observatory of the Jagiellonian University, Krakow)

Presenter(s) : Mr SURESHKUMAR, Unnikrishnan (Astronomical Observatory of the Jagiellonian University, Krakow)

Contribution ID : 14

Type : **Talk**

Comprehensive measurement of pp-chain solar neutrinos in Borexino

Monday, 20 May 2019 10:00 (15)

Session

Presenter(s) : MISIASZEK, M.

Session Classification : Neutrino Physics

Contribution ID : 15

Type : **not specified**

Searches for the Majorana neutrino in GERDA

Monday, 20 May 2019 10:15 (15)

Session

Presenter(s) : PANAS, K.

Session Classification : Neutrino Physics

Contribution ID : 16

Type : **not specified**

Dark matter searches at Super-Kamiokande and its extensions

Monday, 20 May 2019 10:30 (10)

Session

Presenter(s) : MIJAKOWSKI, P.

Session Classification : Neutrino Physics

Contribution ID : 17

Type : **not specified**

KM3NeT: scientific prospects and current status

Monday, 20 May 2019 10:40 (10)

Session

Presenter(s) : WOJACZYŃSKI, R.

Session Classification : Neutrino Physics

Contribution ID : **18**

Type : **not specified**

Cosmic Ray shower simulations for KM3NeT

Monday, 20 May 2019 10:50 (10)

Session

Presenter(s) : KALACZYŃSKI, P.

Session Classification : Neutrino Physics

Contribution ID : **19**

Type : **not specified**

T2K

Monday, 20 May 2019 11:00 (30)

Session

Presenter(s) : ZALIPSKA, J.

Session Classification : Neutrino Physics

Contribution ID : **20**

Type : **not specified**

HESS

Monday, 20 May 2019 12:00 (20)

Session

Presenter(s) : MODERSKI, R.

Session Classification : Gamma Ray Astronomy

Contribution ID : 21

Type : **not specified**

CTA

Monday, 20 May 2019 12:20 (20)

Session

Presenter(s) : NIEMIEC, J.

Session Classification : Gamma Ray Astronomy

Contribution ID : 22

Type : **not specified**

MAGIC, CTA LST

Monday, 20 May 2019 12:40 (20)

Session

Presenter(s) : SITAREK, J.

Session Classification : Gamma Ray Astronomy

Contribution ID : 23

Type : **not specified**

Heliospheric modulation of cosmic rays

Monday, 20 May 2019 14:00 (20)

Session

Presenter(s) : MODZELEWSKA, R.

Session Classification : Cosmic Rays

Contribution ID : 24

Type : **not specified**

Pierre Auger Observatory

Monday, 20 May 2019 14:20 (30)

Session

Presenter(s) : STASIELAK, J.

Session Classification : Cosmic Rays

Contribution ID : 25

Type : **not specified**

JEM-EUSO

Monday, 20 May 2019 14:50 (20)

Session

Presenter(s) : KRÓLIK, K.

Session Classification : Cosmic Rays

Contribution ID : 26

Type : **not specified**

CREDO

Monday, 20 May 2019 15:10 (20)

Session

Presenter(s) : ALMEIDA CHEMINANT, K.

Session Classification : Cosmic Rays

Contribution ID : 27

Type : **not specified**

Theory of high energy processes in Binary Systems

Tuesday, 21 May 2019 09:00 (18)

Session

Presenter(s) : ZDZIARSKI, A.

Session Classification : High Energy Astrophysics

Contribution ID : 28

Type : **not specified**

Theory of Pulsars and Pulsar Wind Nebulae

Tuesday, 21 May 2019 09:18 (18)

Session

Presenter(s) : RUDAK, B.

Session Classification : High Energy Astrophysics

Contribution ID : 29

Type : **not specified**

Theory of Acceleration of Particles

Tuesday, 21 May 2019 09:36 (18)

Session

Presenter(s) : NALEWAJKO, K.

Session Classification : High Energy Astrophysics

Contribution ID : **30**

Type : **not specified**

Theory of Cosmic Ray Origin

Tuesday, 21 May 2019 09:54 (18)

Session

Presenter(s) : GÓRA, D.

Session Classification : High Energy Astrophysics

Contribution ID : 31

Type : **not specified**

Theory of GRBs

Tuesday, 21 May 2019 10:12 (18)

Session

Presenter(s) : JANIUK, A.

Session Classification : High Energy Astrophysics

Contribution ID : **32**

Type : **not specified**

eXTP X-ray time and polarymetry mission

Tuesday, 21 May 2019 11:00 (10)

Session

Presenter(s) : SKUP, K.

Session Classification : High Energy Astrophysics from Space

Contribution ID : 33

Type : **not specified**

MeV Space Observatories

Tuesday, 21 May 2019 11:10 (10)

Session

Presenter(s) : STAWARZ, Ł.

Session Classification : High Energy Astrophysics from Space

Contribution ID : 34

Type : **not specified**

ATHENA - upgrade

Tuesday, 21 May 2019 11:25 (5)

Session

Presenter(s) : RÓŻAŃSKA, A.

Session Classification : High Energy Astrophysics from Space

Contribution ID : 35

Type : **not specified**

Ligo/Virgo observational results

Monday, 20 May 2019 16:00 (25)

Session

Presenter(s) : ROSIŃSKA, D.

Session Classification : Gravitational Waves

Contribution ID : 36

Type : **not specified**

The origin of the coalescing compact object binaries

Monday, 20 May 2019 16:25 (25)

Session

Presenter(s) : BULIK, T.

Session Classification : Gravitational Waves

Contribution ID : 37

Type : **not specified**

Searching for continuous gravitational wave signals from rotating neutron stars

Monday, 20 May 2019 17:10 (20)

Session

Presenter(s) : SIENIAWSKA, M.

Session Classification : Gravitational Waves

Contribution ID : 38

Type : **not specified**

Rotating neutron stars as sources of gravitational waves

Monday, 20 May 2019 16:50 (20)

Session

Presenter(s) : HASKELL, B.

Session Classification : Gravitational Waves

Contribution ID : **39**

Type : **not specified**

Missing black holes and the dark matter puzzle

Tuesday, 21 May 2019 16:45 (15)

Session

Presenter(s) : WYRZYKOWSKI, Ł.

Session Classification : Dark Matter and Dark Energy in Astronomical Measurements

Contribution ID : 40

Type : **not specified**

A signature of sterile neutrino dark matter in the Local Universe

Tuesday, 21 May 2019 17:00 (15)

Session

Presenter(s) : HELLWING, W.

Session Classification : Dark Matter and Dark Energy in Astronomical Measurements

Contribution ID : 41

Type : **not specified**

Toward precise and accurate determination of the Hubble constant based on supernovae Ia, Cepheids and eclipsing binaries

Tuesday, 21 May 2019 17:15 (15)

Session

Presenter(s) : PIETRZYŃSKI, G.

Session Classification : Dark Matter and Dark Energy in Astronomical Measurements

Contribution ID : 42

Type : **not specified**

Constraining cosmological parameters using reverberation-measured quasars

Tuesday, 21 May 2019 17:30 (15)

Session

Presenter(s) : MARTINEZ ALDAMA, M.L.

Session Classification : Dark Matter and Dark Energy in Astronomical Measurements

Contribution ID : 43

Type : **not specified**

Dark matter haloes and their galaxies at $z \sim 3$

Tuesday, 21 May 2019 17:45 (15)

Session

Presenter(s) : DURKALEC, A.

Session Classification : Dark Matter and Dark Energy in Astronomical Measurements

Contribution ID : 44

Type : **not specified**

Instabilities and nonlinear interactions of scalar fields perturbations in models of cosmological inflation

Tuesday, 21 May 2019 11:30 (15)

Session

Presenter(s) : TURZYŃSKI, K.

Session Classification : Theory (Dark Matter, Dark Energy, Early Universe)

Contribution ID : 45

Type : **not specified**

Electroweak baryogenesis and dark matter from a complex singlet scalar

Tuesday, 21 May 2019 11:45 (10)

Session

Presenter(s) : HUANG, D.

Session Classification : Theory (Dark Matter, Dark Energy, Early Universe)

Contribution ID : 46

Type : **not specified**

Higgs domain walls in the thermal background

Tuesday, 21 May 2019 11:55 (10)

Session

Presenter(s) : KRAJEWSKI, T.

Session Classification : Theory (Dark Matter, Dark Energy, Early Universe)

Contribution ID : 47

Type : **not specified**

Testing dark matter with Cherenkov light – prospects of H.E.S.S. and CTA for exploring minimal supersymmetry

Tuesday, 21 May 2019 12:39 (12)

Session

Presenter(s) : JODŁOWSKI, K.

Session Classification : Theory (Dark Matter, Dark Energy, Early Universe)

Contribution ID : 48

Type : **not specified**

Searching for long-lived particles from light dark sectors

Tuesday, 21 May 2019 12:15 (12)

Session

Presenter(s) : DARME, L.

Session Classification : Theory (Dark Matter, Dark Energy, Early Universe)

Contribution ID : 49

Type : **not specified**

Bayesian reconstruction of the Milky Way dark matter distribution

Tuesday, 21 May 2019 12:27 (12)

Session

Presenter(s) : KARUKES, E.

Session Classification : Theory (Dark Matter, Dark Energy, Early Universe)

Contribution ID : 50

Type : **not specified**

Bifurcations in Ratra-Peebles quintessence models and their extensions

Tuesday, 21 May 2019 12:05 (10)

Session

Presenter(s) : HUMIEJA, F.

Session Classification : Theory (Dark Matter, Dark Energy, Early Universe)

Contribution ID : 51

Type : **Poster**

Production of Purely Gravitational Vector Dark Matter

Session

Presenter(s) : SOCHA, Anna

Contribution ID : 52

Type : **Poster**

Cosmic-ray ensembles: from formation to monitoring

Session

Presenter(s) : SUSHCHOV, O.

Contribution ID : 53

Type : **Poster**

Testing dark matter with Cherenkov light – prospects of H.E.S.S. and CTA for exploring minimal supersymmetry

Session

Co-author(s) : HRYCZUK, A.; MOULIN, E.; SESSOLO, E.M.; JODŁOWSKI, K.; RINCHIUSO, L.; ROSZKOWSKI, L.; TROJANOWSKI, S.

Contribution ID : 54

Type : **not specified**

POLAR - detector for Gamma Ray bursts polarization

Tuesday, 21 May 2019 11:20 (5)

Session

Presenter(s) : RYBKA, D.

Session Classification : High Energy Astrophysics from Space

Contribution ID : 55

Type : **not specified**

Welcome

Tuesday, 21 May 2019 14:00 (5)

Session

Presenter(s) : ROSZKOWSKI, L.

Session Classification : Dark Matter, Astrocent, KRAC

Contribution ID : 56

Type : **not specified**

Official remarks

Tuesday, 21 May 2019 14:05 (20)

Session

Session Classification : Dark Matter, Astrocent, KRAC

Contribution ID : 57

Type : **not specified**

International Research Agenda and other programs of FNP

Tuesday, 21 May 2019 14:25 (20)

Session

Presenter(s) : ŻYLICZ, M. (Foundation for Polish Science)

Session Classification : Dark Matter, Astrocent, KRAC

Contribution ID : 58

Type : **not specified**

Understanding Our Universe from Deep Underground

Tuesday, 21 May 2019 14:45 (35)

Session

Presenter(s) : MCDONALD, A. (Queen's University)

Session Classification : Dark Matter, Astrocent, KRAC

Contribution ID : 59

Type : **not specified**

EGO and European Road Map for Astroparticle Physics

Tuesday, 21 May 2019 15:20 (15)

Session

Presenter(s) : KATSANEVAS, S. (Director of European Gravitational Organisation and AstroCeNT International Scientific Committee chair)

Session Classification : Dark Matter, Astrocent, KRAC

Contribution ID : **60**

Type : **not specified**

The DarkSide Program of Dark Matter Searches and Its Broader Impact

Tuesday, 21 May 2019 15:35 (20)

Session

Presenter(s) : GALBIATI, C. (Princeton University and GSSI)

Session Classification : Dark Matter, Astrocent, KRAC

Contribution ID : **61**

Type : **not specified**

AstroCeNT

Tuesday, 21 May 2019 15:55 (20)

Session

Presenter(s) : ROSZKOWSKI, L.

Session Classification : Dark Matter, Astrocent, KRAC

Contribution ID : 62

Type : **Poster**

Search for Axionlike Dark Matter through Nuclear Spin Precession in Electric and Magnetic Fields

Data collected in the measurement of the neutron electric dipole moment (nEDM) were used to look for the ultralow-mass axionlike dark matter. Analysis of ratio of frequencies of spin-precession of ultracold neutrons and ^{199}Hg atoms enabled us to estimate an axion-induced oscillating electric dipole moment of the neutron and an axion-wind spin-precession effect. Our null result sets the first laboratory constraints on the coupling of axion dark matter to gluons, which improve on astrophysical limits by up to 3 orders of magnitude, and also improves on previous laboratory constraints on the axion coupling to nucleons by up to a factor of 40.

Session

Presenter(s) : ZEJMA, Jacek (Jagiellonian University)