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Concluding remarks

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Abstract. Short review of the conference

1. Introduction

The main topics of the conference are:
Cosmology.
X-ray sources.
Jets and GRBs.
Missions and Experiments.
Solar System.
Cosmology.

2. Cosmology

S. Colafrancesco: observations of SZ effect may solve most problems in cosmology.

R. Rebolo: CMB polarization as indicator of primordial gravtational waves

M.Regis: CMB in inhomogeneous universe acceleration of expansion without DE. Is spectrum remains Planckian in such universe?

K. Maeda: SN1a too many parameters for a good standard candle in cosmology

3. X-ray sources

P. Blay: discovery of supergiant fast X ray transient SFXT in the Integral observations clumps in the stellar wind

M. Nowak: review on Cyg X1, discussion on origin of the soft-hard (high-low) states – 3 models. In this connection I would like to remind our old paper with S. I. Blinnikov "A hot corona around a black-hole accretion disk as a model for Cygnus X-1", published in Sov.Astron.Lett. 2, 191-193 (Sep.-Oct. 1976) (see also astro-ph /0003275). The main conclusions of this paper are:

"For $L \approx 0.1 L_c$, when acoustic heating predominates, the rise in $\dot{M}$ may cause some decrease in the heating of the corona and in the amount of hard radiation. At the same time the flux in the soft range is determined by the radiation of the disk photosphere and will increase with $\dot{M}$.

Even if a corona with $T \approx 10^9$ K is present in the disk accretion model, radiation cannot be formed at $h\nu = 200 - 2000$ keV. Electrons with $T_e = 10^{10}$ K or fast nonthermal electrons would be needed for that purpose. There are in fact two ways to form such fast electrons. Both would require the presence of a magnetic field in the disk. A magnetic field could exist in the disk either through twisting of the lines of force by differential rotation, or through infall onto the black hole of magnetized material having a small angular momentum. In the latter case a poloidal magnetic field would be generated.

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... mechanism for producing fast particles is analogous to the pulsar process. If magnetized matter with low angular momentum falls into the black hole (in addition to the disk accretion), a strong poloidal magnetic field will arise. By analogy to pulsars, rotation will generate an electric field of strength $E \approx (v/c)B$ in which electrons are accelerated to energies $\varepsilon \approx R(v/c)Be \approx 3 \cdot 10^4[B/(10^7\text{Gauss})]$ Mev where $v/c \approx 0.1$, and $R \approx 10^7$ cm, is the characteristic scale. In a field $B \approx 10^7$ Gauss, such electrons will generate synchrotron radiation with energies up to $\approx$ 105 keV. Just as in pulsars, it would be possible here for e^+e^- pairs to be formed and to participate in the synchrotron radiation."

4. Jets and GRBs

J. Beall: Jet heating by the two stream instability. Heating by the transformation of the mechanical energy of the jet into heat. It happens probably in heating of all kinds of jets.

No discussion about GRB central machine. GRB statistics and correlation properties.

L.Amati: correlation between peak luminosity and isotropic fluence in the local coordinate system. Correlation disappears in the observer system, what indicates to its physical meaning.

A. de Ugarte- Postigo, R. Salvaterra: properties of farthest GRB, largest z=9.4.

D. Fragion: linear increase of the GRB luminosity with red shift poorly explained in the cosmological model.

Critical experiment: spectra and polarization of the prompt optical emission, in the first one minute after trigger.

5. Missions and experiments

N. Schartel: XMM-Newton.

P. Ubertini: Integral.

J. Ballet: Fermi.

K Ebisava: Suzaku, broad K-lines are not due to relativistic widening.

C. Pittori: Agile, best in the region ¡ 100 MeV.

N. Panagia: HST.

M. Tluczykont: H.E.S.S.

M* D. Rodrigies-Frias: Pierre Auger. Particle acceleration Bottom-up and Top-down models.

P. Persi: Herschel. Star forming regions and Crab nebula in IR.

J.Tauber: Planck mission. 9 frequencies, minimal published results after 2 years.

J. Clavel: ESA plans. Cosmic vision 10 years after 2017.

6. Solar system

W. Kundt: doubts in the existence of termination shock