[S14-3] Radiative Collimation of Jets Around Black Holes

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It is widely believed that jets around black holes are collimated by toroidal magnetic field. We find another mechanism, i.e., radiations coming out from a Two Component Accretion (TCAF) disc is able to collimate pair plasma jets. In the 'hard state', the general structure of TCAF disc is, an outer Keplerian disc sandwiched between sub-Keplerian flow, and a sub-Keplerian, shocked, torus-like inner portion of the disc called CENBOL. This hot, puffed up CENBOL intercepts significant fraction of 'soft' photons from the Keplerian disc to produce the 'hard' power law tail. We find that in the intermediate hard states the soft photons collimates the jet. We also find that the collimation is better when the shock in accretion is situated further out. In addition to this we find, the hard radiation from the CENBOL is a good accelerator too. Therefore it is possible to produce relativistic and collimated pair dominated outflows by radiations from TCAF disc.

[S14-4] Predictions for Cosmological Survey with ASTRO-F/FIS Observations

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The Far-Infrared Surveyor (FIS) is one of the focal-plane instruments on the ASTRO-F satellite, which will be launched in early 2006. Based upon source distribution models assuming three different cosmological evolutionary scenarios, an extensive model for diffuse emission from infrared cirrus, and the instrumental noise, we present a comprehensive analysis for the determination of the confusion levels for far-infrared surveys. We use our derived sensitivities to suggest best survey configurations for ASTRO-F/FIS mission. From our analysis of confusion limits, we estimate final confusion limits of 6.4 - 17 mJy and 34 - 88 mJy at 75 μm and 140 μm for ASTRO-F/FIS mission in low cirrus regions. If the source distribution follows the evolution models, it will be mostly limited by source confusion. We have also generated all sky map for final confusion limits. We obtain the optimal confusion limited redshift distribution for our source count models. Finally, we predict the Cosmic Far-Infrared Background (CFIRB) which includes the information about the number and distribution of contributing sources. We find that we can detect CFIRB fluctuations in most of low-to-medium cirrus regions.