The nature of the diffuse emission above 100 keV from the Galactic ridge

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**ABSTRACT**

The inner Galaxy is a source of apparently diffuse continuum emission above 100 keV, in addition to the positronium and 511 keV line emission. We compare observational results from INTEGRAL/SPI with those from other instruments in order to give an evaluation of the current experimental situation. We make a comparison with standard models for continuum emission, but these appear inadequate. An additional process such as in-flight annihilation of positrons or knock-on electrons may be required, or a population of undetected sources with hard spectra could be responsible.

**MOTIVATION**

Compare INTEGRAL analyses of the diffuse Galactic continuum

SPI:
Bouchet et al. 2005: spatial model fitting
Strong et al. 2005: multi-component spatial model fitting
Knoedlseder et al. 2007: MREM imaging

IBIS:
Terrier et al. 2004: spatial model fitting
Krivonos et al. 2006: on-off method

**COMPARISON OF DATA**

**SPI**

DIFUSE SPECTRUM OF INNER RADIAN

**IBIS**

Krivonos et al. have upper limits > 60 keV, which do not contradict the SPI spectrum within a factor 2. Above 200 keV no constraint from IBIS.

**INTERPRETATION**

The hard power-law diffuse continuum 100 keV – 10 MeV is not easy to assign to known mechanisms: inverse Compton and bremsstrahlung seem insufficient. In-situ electron acceleration (Dogiel et al. 2002) is one possible way to produce the emission avoiding the energetics problem.

Or maybe it is some other diffuse process: in-flight annihilation of high-energy positrons? or cosmic-ray knock-on secondary electrons?

If the 100 keV – 10 MeV diffuse emission is indeed from sources it will have implications for the GLAST diffuse emission studies, since these sources may also emit >30 MeV.

This is complementary: GLAST will uncover more sources which will help to clarify the spectra and distribution of source populations.

**REFERENCES**


For more information: http://www.am.ub.es/bcn06/