28.21

A New Rapidly Oscillating Ap Star in the Northern Hemisphere
C.H. Heller (Yale), K.S. Kramer (MLO/SDSU)

We monitored the star HD 176232 (HR 7167; 10 Aql), photometrically for ~25 hours over seven nights during July 1988 with the Mount Laguna Observatory one meter telescope. A frequency analysis of these observations show that at least three periodicities are present in the light variations and confirms the variability reported by Heller and Kramer (1987). The three frequencies have been tentatively identified as  \( f_1 = 1.448 \text{ mHz} \),  \( f_2 = 1.385 \text{ mHz} \),  \( f_3 = 1.251 \text{ mHz} \) and with semi-amplitudes of 0.39, 0.37, and 0.29 mmag respectively (see figure below). No rotational splitting was apparent. Other periodicities may be present, but because of their low amplitudes they cannot be identified with confidence. Further observations, preferably from multiple sites, will be needed to fully determine the frequency structure of this low amplitude variable.

![Graph of HD 176232](image)

Session 29: Quasars and Continua of Active Galactic Nuclei
10:00–11:30 am, Salon E

29.02

Hot Ion Model for the X-Ray Spectra of Active Galactic Nuclei.
C. D. Dermer (Physics Department, Lawrence Livermore National Laboratory, Livermore, CA)

A magnetized, two-temperature ion/electron plasma is analyzed under the assumption that the magnetic field energy density is in equipartition with the radiation field energy density. Coulomb coupling is the primary heating source of the electrons, and ion production from ion collisions provides an important source of soft photons through synchrotron radiation from pion-decay positrons when the ion temperature exceeds ~20 MeV. The two-parameter (ion temperature and Thomson depth) model gives a range of X-ray spectral indices and compactnesses in reasonable agreement with observations, as recently summarized by Lightman and Zdziarski [Ap. J., 319, 643, 1987].

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29.03

Hard X-ray Balloon Observations of Selected Active Galactic Nuclei
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We present results from hard x-ray balloon observations of Active Galactic Nuclei (AGN) carried out by the Energetic X-ray Imaging Telescope Experiment (EXITE). EXITE is a coded-aperture telescope for x-rays in the energy range from 20 to 300keV, with an angular resolution of 20 arcmin in a 3.4° field-of-view. This angular resolution is sufficient to make clear distinctions between point-sources in crowded regions of the sky, like the Galactic Center. EXITE was successfully launched on a 28 m cu.ft. balloon from Fort Sumner, NM, at 23:40 UT October 8, 1988, and remained at float altitude for 19 hours. Among several other x-ray sources, we observed the QSO 3C 273 and the Seyfert galaxy NGC 4511. We present EXITE imaging and spectral results for these AGNs. We also show 2-20 keV spectra obtained with the Einstein Observatory Monitor Proportional Counter (MPC), taking into account recently improved background determinations, for comparison with EXITE data.

29.04

Variability in the Steep X-ray Spectrum of the Quasar PG1211+143

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EXOSAT and Einstein studies of PG1211+143 show that its extraordinarily steep low energy spectrum is a persistent feature over at least 7 years. The strength of the steep spectrum nevertheless changes by factors of 2–3 on relatively short timescales. Two low energy (<0.15 keV) variations, from CMA 3XL filter data, are particularly interesting: a factor 3 decrease in 190 days, and the shortest variation of a factor of 2.3 increase in 19 days. The higher energy (2–10 keV) ME data vary by a smaller factor than the LE/CEA count rates, suggesting that the emission in the bands is linked but only weakly. Such rapid variability rules out an extended source for the soft x-ray spectrum and also an optically thin plasma at the source of the emission. The most obvious remaining candidates are associated with the inner regions of an accretion flow, in particular a disk.

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