The EUV spectrum of AU Microscopii in a quiescent phase.

G. Del Zanna, M. Landini, S. Migliorini
Dipartimento di Astronomia e Fisica dello Spazio, Università di Firenze, Italy

B.C. Monsignori Fossi
Osservatorio Astrofisico di Arcetri, Firenze, Italy

1. Data analysis

The July 22, 1993 observation of the dMe star AU Microscopii, recorded by the Extreme Ultraviolet Explorer (EUV) spectrometers is analysed. No large variation of count rates occurred during the observation. The Short (SW, 70 - 190 Å) and Medium (MW, 140 - 380 Å) wavelength spectra of this quiescent phase are compared with the July 14-17, 1992 observation (Monsignori Fossi et al., 1995), that included a quiescent phase and two flare events (Cully et al., 1993).

Using the theoretical spectrum for high temperature plasmas (Monsignori Fossi and Landini, 1996) and the inversion technique developed by Monsignori Fossi and Landini (1994), the differential emission measure (DEM) analysis is performed on a few reasonably detected lines and the synthetic spectra in the region 80 - 340 Å are computed.

2. Conclusions

The light curve of the integrated SW channel for the July 1993 observation shows, over more than 40 hours, a quiet activity similar to the quiet preflare phase of the July 1992 observation.

Very large differences occur in the spectra of the quiescent and flare phase. Several highly ionized iron lines (Fe XXIII (+XX) 132.8 Å, Fe XXII 135.7 Å, Fe XXI 128.7 Å, Fe XXII 117.2 Å, Fe XXIV 192.4 Å) are much more prominent during the flare, while the low temperature region of the atmosphere of the star is much less sensitive to the activity (the HeII 303.8 Å line is only about a factor two brighter during the flare).

A DEM analysis for the July 1993 has been performed and two solutions corresponding to different iron abundances are obtained. If one assumes the iron cosmic abundance, a high temperature component is required to justify the continuum between 80 and 120 Å; if the iron abundance is depressed the hot component may be removed. On the contrary the flare phase requires a high temperature plasma (≈ 6 10^7 K).
Figure 1. The SW spectrum: comparison between the synthetic spectrum evaluated using the DEM distribution and the spectral code of Monsignori Fossi and Landini (top) and the observed spectrum (center). The signal to noise ratio binned over 7 pixels of spectral resolution is shown bottom to estimate the reliability of the detection.

References