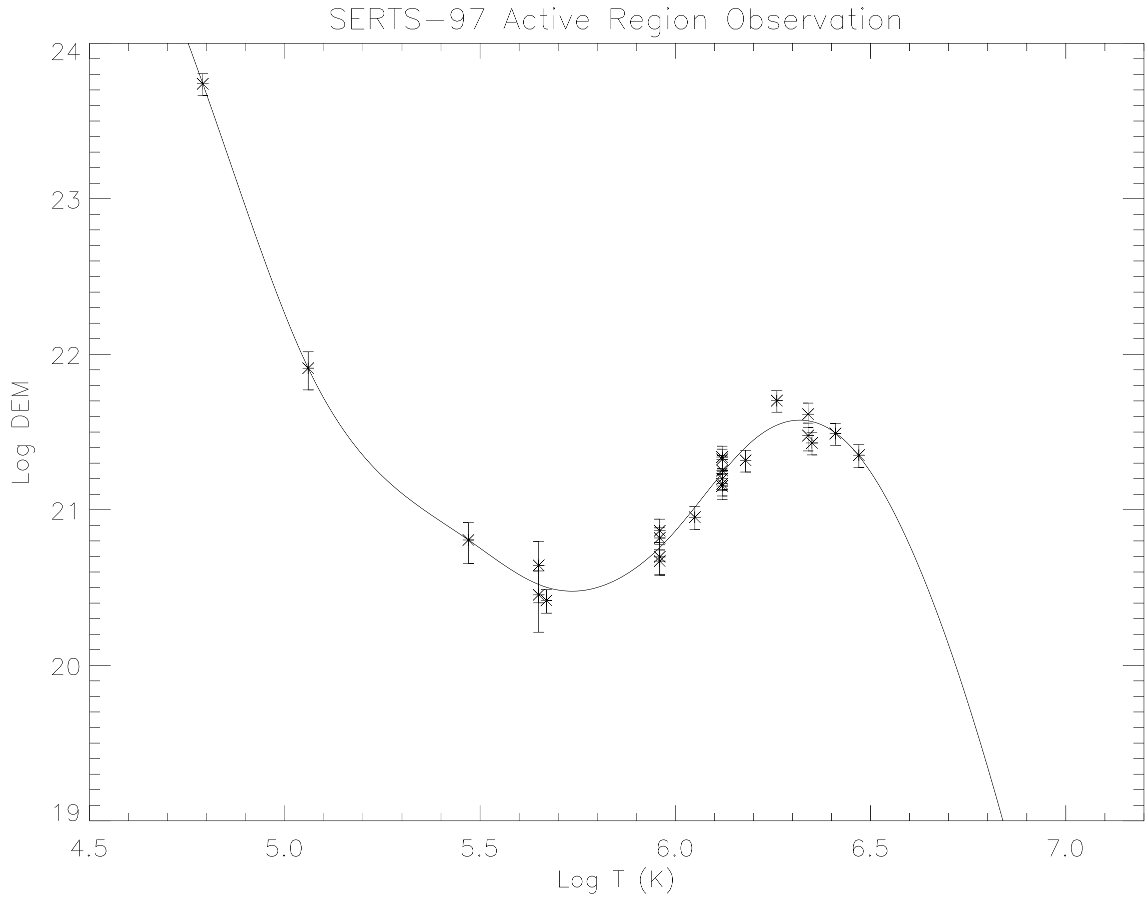
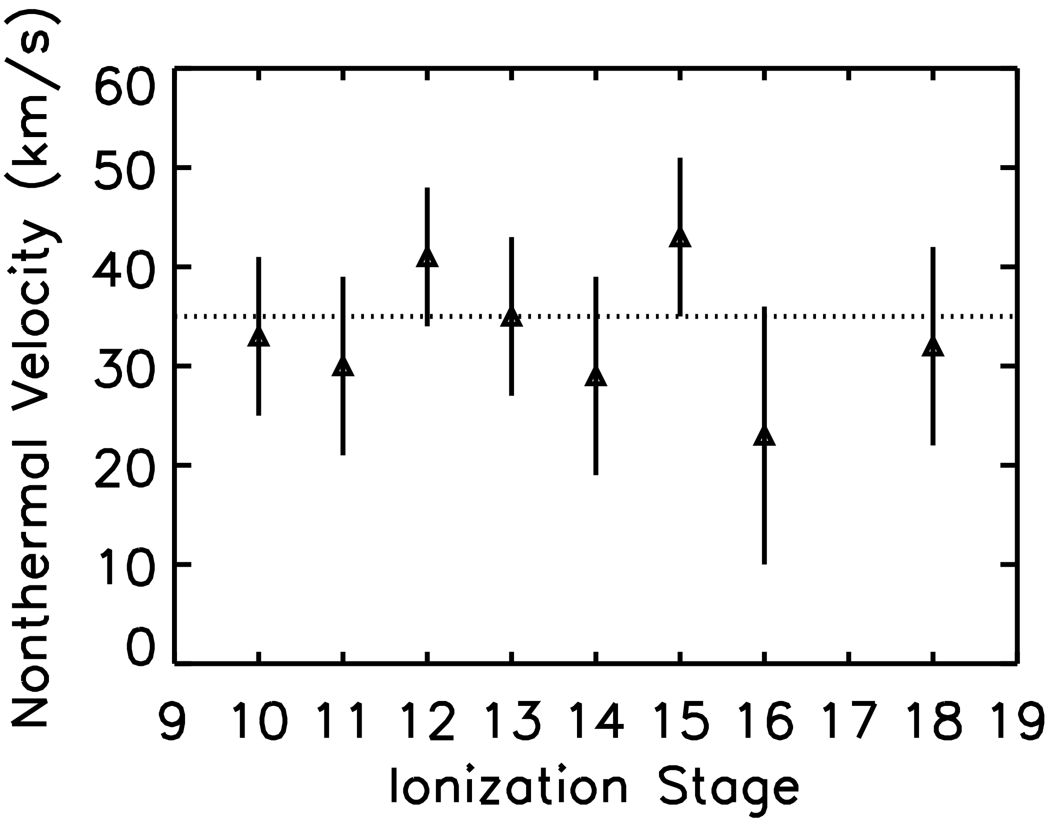
# Active Region Properties From SERTS-97: Figure 1




The differential emission measure (DEM, in units of $cm^{-5}$ $K^{-1}$) quantifies how plasma in an emitting source is distributed with temperature. Here we show the DEM for solar Active Region 8108, derived from the SERTS-97 average active region spectrum obtained during the 1997 Nov 18 flight of Goddard Space Flight Center's Solar EUV Research Telescope and Spectrograph. The rocket instrument carried an intensified CCD-detector and a multilayer-coated toroidal diffraction grating with enhanced sensitivity over that of a standard gold-coated grating throughout the instrument's 299 – 353 Å spectral bandpass. Nearly 100 emission lines are observed in the well calibrated spectrum. These lines come from multiple ionization stages of Fe ($Fe^{+9}$ - $Fe^{+16}$, also written Fe X - Fe XVII), Mg, and Si, and include lines from He, C, S, Al, and Ni. The spectrum sampled a wide range of plasma temperatures, from less than $10^5$ K to $4 \times 10^6$ K. The DEM was derived using the method of Landi & Landini (1997), the CHIANTI Version 2.0 atomic physics database (Landi *et al.* 1999), the Mazzotta *et al.* (1998) ionization equilibrium computations, and the Feldman (1992) coronal element abundances. It exhibits a relative minimum at log T $\sim$ 5.7, a broad maximum around log T $\sim$ 6.3, and a rapid decline for log T $\gtrsim$ 6.6.

# Active Region Properties From SERTS-97: Figure 2




Nonthermal velocities were derived from the strongest emission lines of Fe X – XVI and Ni XVIII in the SERTS-97 average active region spectrum, and are displayed above as a function of ionization stage. A nonthermal velocity is derived when the measured width of an emission line exceeds the width expected for a temperature corresponding to the ion's formation temperature. Within the measurement uncertainties, all of the nonthermal velocities are consistent with a value of 35 km $s^{-1}$. Measurements like these are possible because of the instrument's high spectral resolution (115 mÅ instrumental FWHM). In addition, density-sensitive line intensity ratios were used to derive electron densities $n_e$ ($cm^{-3}$). The intensity ratio of Fe XI lines at 308.55 and 352.67 Å yield log $n_e = 9.92 \pm 0.28$. Similarly, Fe XII 338.27/352.11, Fe XIII 320.80/312.17, and Fe XV 321.78/327.03 yield log $n_e$ $= 9.74 \pm 0.28$, $9.52 \pm 0.30$, and $9.62 \pm 0.26$, respectively. [From J. W. Brosius, R. J. Thomas, J. M. Davila, & E. Landi, *The Astrophysical Journal*, vol. 543, p. 1016 (2000 Nov. 10).]