estimate of the total absolute intensity of the transition zone.

16 Extreme Ultraviolet Solar Limb Brightening Observations of Lithium-Like Ions. J. T. MARISSA and G. L. WINTHROPE, Center for Astrophysics, Harvard College Obs. and Smithsonian Astrophysical Obs. - Limb brightening curves at EUV resonant lines of O VI and Mg X have been constructed from spectroheliograms (5 arc sec spatial resolution) of a quiet limb region observed with the Harvard experiment on Skylab. These curves are interpreted with a simple model of the transition region and quiet corona. Above the limb, the influence of inhomogeneities becomes apparent. The results are discussed in the light of recently proposed inhomogeneous models of the transition region and corona.

17 Representative Temperatures for Coronal and Transition Region Ions. DONALD E. BILLINGS, K. COLO. - Following a suggestion by Gabriel and Jordan (1972 Case Studies in Collision Physics, Vol. II, ed. E.W. McDaniel and W.R.C. Cowling, Amsterdam, North Holland) we have computed the temperature at which the radiation per unit temperature interval Q = N_k T^4 dT/df maximizes for various ions in the corona and transition region. The temperature maxima are essentially independent of the atmospheric model chosen to fit the EUV data. This follows since Q is proportional to N_k T^4 exp (hυ/kT), where T is the ratio of the square of the pressure to the thermal conductive flux, and d log T per T per degree of activity when viewed at the limb of the solar disk.

Q maximizes for temperatures 0.2 K less that maximum of N_k T^4 for low temperature ions such as O I and Si II and III. For ions of 10^5 to 10^6 K, N_k and T about the same temperature. For coronal ions, Q maximizes at a higher temperature than N_k T^4.

18 Polar Transients Observed in the EUV. G. L. WINTHROPE and D. JAFFE, CMTR. - A number of transient events have been found in observations of polar coronal holes by the Harvard EUV experiment on Skylab. These transients appear to have the characteristics of small surges or giant spicules that reach as high as 40 to 50 arc seconds above the limb and have lifetimes of the order of 10 to 15 minutes. Two of these features, called macrospicules by the NRL group, have been studied in detail. Both features are clearly visible in Lyα λ 1216, C II λ 1335, C III λ 977 and O IV λ 554, but could not be detected against the background coronal emission in O VI λ 1032 and Mg X λ 629. Both events appear to be caused by a jet of chromospheric material that shoots upward to a height of 35,000 km above the limb and then falls back into the chromosphere reaching a terminal velocity of 140 km/sec. Most of the mass of the macrospicule appears to be contained in a cylindrical volume with a mean temperature of 10^5 K and a mean density of 10^6 electron cm^-3. Higher temperature EUV emitting material, containing about 10% of the spicular mass, is contained in the transition sheath that provides the interface between the cool core of the macrospicule and the surrounding corona. The macrospicule appears to be nearly in pressure equilibrium with the surrounding corona and energy required to produce each of the events is about 5 x 10^4 ergs.

19 Macro-Spicules in He II 304 A Over the Sun's Polar Cap. J. D. BORLIN, S. N. VOGEL, J. D. PORCELLI, N. R. SHELEY, R. TUSEY, and M. E. VAN BOOIJER, Naval Research Laboratory - Spectroheliograms taken by the NRL/Skylab experiment 5082A in the extreme-ultraviolet (170-630 A) reveal a major new phenomena of the sun's polar cap, which we call polar macro-spicules. These macro-spicules appear in the resonance line He II 304 A as long, usually pointed jets ranging in length from 5 to over 60 arc sec. The macro-spicules occur only over the polar cap of the sun as defined by the polar coronal holes seen in coronal lines such as Mg IX 368 A. They have no apparent counterpart in the visible wavelengths; in particular, they are substantially different from the well known He II spicules in nearly every characteristic.

J1 Center to Limb Variations in Solar Hard X-Ray Spectra. D. W. Datlowe, M. J. Elcan, H. S. Hudson, and L. E. Peterson, University of California, San Diego. - The study of longitude variations of solar X-ray emission is a powerful technique for examining the geometrical structure of X-ray emitting regions. The visible disk of the sun, variations from center to limb will reveal any anisotropy which may be present in the X-ray emission; this gives information on the emission region geometry. Occultation of lower portions of a burst by the limb will give additional information about the spatial extent of the emitting regions.

The UCSD solar X-ray experiment on the OSO-7 satellite has observed 37 soft X-ray bursts identified as having occurred behind the limb; two-thirds of these exhibited hard X-ray components, the same fraction as events near the center of the disk. This shows that at least some of the hard X-ray emission must come from considerable heights in the corona.

Comparison of the distribution of the spectral slopes of 62 hard X-ray bursts from near or beyond the limb with that of events near the center of the disk shows that the two differ significantly. The difference may be characterized as a lack of the hard X-ray spectrum (λ < 3.5) near the limb.

J2 The Shape of the Hard Solar X-Ray Spectrum. M. J. Elcan, D. W. Datlowe, H. S. Hudson, and L. E. Peterson, University of California, San Diego. - The hard solar X-ray burst spectrum is generally well described by a power law between 15 and 60 keV; this is taken to be evidence that the origin of the hard X-rays is bremsstrahlung from a power law spectrum of electrons at the sun. If the electron spectrum extends as low as 10 keV, then the energy in these electrons may be comparable to the entire energy of the flare. Steepening of the spectrum has been observed in some cases above 60 keV, and has been interpreted as a corresponding cutoff in the electron spectrum. An alternative explanation of the hard X-ray spectrum is bremsstrahlung from a hot plasma with kT ~ 20 keV. In this case the energy of the hard X-ray emitting