cannot rule out the possibility that the star is a binary like 3 Puppis v Sge. With a high Galactic latitude (b = -20°), the object is probably not a true supergiant. High dispersion spectroscopy and a radial-velocity study are planned.

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22.15 The Discovery of a Hot Stellar Wind, R. L. WHITE, ST ScI, R. H. BECKER, VPI-SU. High resolution radio observations of two early-type stars have been made with the VLA. Cyg OB2 No. 12 is resolved and has a normal wind with a temperature of about 5000 K. Cyg OB2 No. 9 is completely unresolved at 6 cm. When combined with flux measurements at 2 and 20 cm, this observation implies the radio-emitting circumstellar gas around Cyg OB2 No. 9 is at least 100,000 K. The entire wind from this star is apparently 8 to 10 times hotter than the stellar surface.

22.16 Non-LTE Line Blanketing: A Code and Some Early Results, L. S. ANDERSON, U. of Colorado. Below are temperature vs. depth profiles for an atmosphere composed of hydrogen and helium at (Teff, log g) = (35000, 4), computed with a new, independent, non-LTE code. The curves include atomic transitions and radiation as follows: (a) Equivalent to Mihalas and Auer 1970 (Ap. J. 160, 1181) with nearly identical result; (b) a new more hydrogen and helium continua in non-LTE; (c) b+12 more Lyman and Balmer lines in non-LTE; (d) c+6 Paschen 8 and 5 more high level α's in non-LTE; and (e) d with 5 point angle quadrature. The lines are treated with fully depth dependent Stark-Doppler profiles in complete redistribution. Although the temperature changes considerably from the original Mihalas and Auer model, the level populations change in such a way as to make the emergent profiles almost unchanged. In this particular model, only about 5% of the flux is blocked by the converging Lyman series. The time and storage requirements of the code are almost independent of the physical approximation of a given transition (LTE vs. non-LTE, profile, redistribution) and linearly proportional to the number of transitions and frequencies used to describe a model. Models including the resonant transitions of light metals are being constructed.

Session 23: Solar Astronomy
0930-1700 (Stanbro Hall)
(Display Presentation)

23.01 Multiple Energetic Injections in a Strong Spike-Like Solar Burst. P. KAUFMANN, E. CORREIA and J. B. COSTA, INPE, Brazil, B. R. DENNIS, NASA/GSFC, USA, G. HURFORD, CALTECH/OVRO, USA, J. C. BROWN, Univ. Glasgow, UK. One intense and fast spike-like solar burst was observed with high sensitivity at microwaves and hard X-rays, in November 1980, December 1980, and January 1981. It was shown that the burst was built up by time structures superimposed to an underlying flux emission which time evolution was remarkably proportional at hard X-rays and microwaves. The finer time structures were better defined at mm-microwaves, displaying at the peak of the event a repetition rate of about 16 s⁻¹. A slower "modulation" component of about 1 second was identified at microwaves and hard X-rays throughout the burst duration. Similarly to what has been found for mm-microwaves burst emission, we suggest that also X-ray fluxes might be proportional to the repetition rate of multiple energetic injections, quasi-quantized in energy. We estimate for one injection the production of a pulse of photons with about 4 x 10³⁴ erg for r ≠ 25 keV. If the hard X-rays are produced primarily by thick-target bremsstrahlung, exhibiting a power-law energy spectrum, for r ≠ 25 keV each pulse would result from the acceleration of about 4 x 10³⁴ electrons with a total energy content of about 5 x 10³⁷ erg. We propose to reconcile the "elementary flare burst" concept, to multikernel emission convoluted in time and space, and to the quasi-quantization of primary energetic injections. The slower "modulating" time scales are suggested to be associated to "elementary flare bursts", each one consisting in a single loop flaring into a number of explosions. The interaction between loops may account for the clustering of elementary flare bursts.

23.02 Correspondence Between 6 cm and Optical Images of a Solar Active Region. D. McConnell, E.J. Schnähl and M.R. Kundu, Univ. of Md. Astronomy Program. We present a VLA 6 cm image of a complex solar active region (Boulder nos. 3106 and 3112) observed on 17 May 1981. The radio data came from nearly 7 hours of synthesis and are free from flare-induced variations. These ideal conditions have allowed a very reliable 6 cm map to be made which has a 61 x 315 field of view and a spatial resolution of 3″. We have compared the image with white light and Hα images and magnetograms (courtesy of H. Lagg, BBSO and J. Harvey, KPAO respectively). We find strong correspondence with all of the 10-15 radio features having counterparts in either the white light, Hα or magnetic images. In particular, we find partially filled polarized rings of emission over 3 of the sunspots in the group and strong radio sources over the neutral lines in the magnetogram. These results give strong support to previous observers who have favored thermal gyroresonance emission as the radiating mechanism in solar active regions and also to the model calculation of sunspot associated emission performed by Alissandrakis et al. (1980) (Astro. Astrophys. 82, 30, 1980).

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