04.33.05 Resonance Line Formation and the Wilson-Bappu Relation in Supergiants. G. S. BASRÌ, JILÀ, Univ. of Colo. & NBS. - The luminosity-width relation for the Ca II K line discovered by Wilson and Bappu is commonly used to determine absolute luminosities and distances of late-type stars. I investigate why the K; and Mg II k; widths (measured at a given base of the emission features) increase with decreasing stellar gravity using a partial redistribution radiative transfer code. I have found that the K; and k; widths in supergiants are neither determined simply by turbulent velocities nor by the mapping of the temperature minimum at larger values of Δβ from line center with decreasing stellar gravity as proposed by Ayres (Ap. J., 228, 509 (1979)). An essential aspect of the problem is the extreme coherency of resonance line wings in the low density atmospheres of supergiants, which decouples the monochromatic line source function from the wings from local atmospheric properties.

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05.33.05 Capella: 1/2 of an RS CVn? T. R. AYRES* and J. L. LINSEY, JILÀ, Univ. of Colo. & NBS. - We report results of a study of the bright binary Capella (06 III + P9 III) based on 1200-3000 Å spectra obtained by the International Ultraviolet Explorer. We find no evidence for a massive stellar wind from Capella, contrary to interpretations of emission-line spectra (O'Neal, 1975, Ap. J., 200, L27). Using high resolution spectra obtained at several different orbital phases, we conclude that virtually all of the emission in lines hotter than Si II, and the bulk of the low temperature emission, comes from Capella B rather than Capella A. Surface fluxes of prominent hot lines in Capella B are roughly 100 times the corresponding quiet Sun surface fluxes, whereas those of Capella A are more nearly solar. We propose that the considerable differences in ultraviolet emission from these ostensibly similar giants is due to the only property that apparently is much different in the two stars: Capella B is a rapid rotator while Capella A is a slow rotator. Capella B therefore shares important properties with the short-period RS CVn systems - large UV (and probably also X-ray) fluxes and rapid rotation - whereas Capella A has a more nearly solar-type outer atmosphere. The dichotomy between Capella B and Capella A is reminiscent of the Ca II activity-rotation connection described by Kraft (1967, Ap. J., 150, 511) and Skumanich (1972, Ap. J., 171, 565). The connection itself may be due to the enhancement of surface magnetic fields owing to the strengthening of the hydromagnetic dynamo in rapidly rotating stars. We suggest that Capella's designation as a long-period RS CVn system is improper. In reality, Capella B is an RS CVn-type star but Capella is not an RS CVn-type system.

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06.33.05 IUE Ultraviolet Spectra and Chromospheric Models of HR 1099 and UX Ari. T. SIMON and J. L. LINSEY, JILÀ, Univ. of Colo. & NBS. - We discuss spectra of the RS CVn-type systems HR 1099 and UX Ari obtained with the IUE spacecraft. The spectra cover the wavelength region 1175-2000 Å in low resolution and the wavelength region 2000-3200 Å in high resolution. In August 1978 we obtained spectra at three different phases for both stars while they were quiescent. In addition, we have a spectrum of HR 1099 on 1 March 1978, near the end of a long flaring episode, and a spectrum of UX Ari on 15 August 1978 during a flare. The strong emission lines recorded during quiescent and flare phases include chromospheric and transition region lines of H I, He II, C I-IV, N V, O I, Mg II, and Si IV. We construct chromospheric models to match C II and Si II line fluxes and compare these models with models of quiet and active chromosphere single stars.

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07.33.05 Accretion of Interplanetary Dust by Ap and Am Stars: C. K. KUMAR, H. M. U. and R. S. HANS. Interplanetary (?) dust in the size range 1000-10,000 Å will spiral into A stars by the Poynting-Robertson effect in less than 10 years. They will evaporate and the ions will spiral in along the magnetic field lines. Evidence from solar system will be summarized to show that the requisite amount of material to explain the abundances falls in 10 years. High temperatures include such as those in Allende meteorites are mostly about 10Å diameter and are enriched in rare earths by about a factor of 25.

08.33.05 Absolute Far-Ultraviolet Flux Distributions for Early-Type Stars in Orion. R. N. BECKATHORN and G. R. CARVERTHURS, NEL. - Spectra in the 950-1600 Å wavelength range, with about 2 Å resolution, were obtained.