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Ca II H AND K LINE VARIABILITY IN THE Ap STAR HD 43 819

HD 43819 (HR 2258), which was classified as a B9IIIp Si, (Cr) star (Cowley 1972), is a single wave photometric variable with a period of 1.0785 days (Winzer 1974). I obtained several 4.3 Å/mm I Ia0 spectrograms with the 2.5-m telescope at Mt. Wilson Observatory and several 8.9 Å/mm I Ia0 spectrograms with the coude feed telescope at Kitt Peak National Observatory and borrowed additional spectrograms from the Mt. Wilson Observatory plate file and staff. While studying the intensity vs. wavelength tracings of these plates, I noticed that the Ca II H and K line profiles contained a second component on several spectrograms, my Mt. Wilson Observatory spectrograms Ce21999 and Ce22006 as well as the 4.5 Å/mm Palomar Observatory spectrogram Pb11415. But these lines are definitely single on my Mt. Wilson Observatory spectrogram Ce22576 as well as on two 9 Å/mm Palomar Observatory spectrograms (Pc8488 and Pc9981), a 10.4 Å/mm Mt. Wilson Observatory spectrogram (Ce15086), and three of my Kitt Peak Observatory spectrograms (D3899c, D6018, D6031). My Kitt Peak Observatory spectrogram D4410a suggests that the K line is single while the H line may contain a second component. The difference in midexposure times between Ce21999 and Ce22006 is 24 hours and 23 minutes which is consistent with Winzer's period. However, the uncertainty in the period does not permit the use of the midexposure times of the other spectrograms which show H and K lines with secondary minima to improve the period of variability.

A careful examination of the 4.3 and 4.5 Å/mm spectrograms did not reveal any evidence for second components in lines other than the H and K lines. The apparent rotation velocity is 14 km s^{-1} (Wolff and Preston 1978). But the maximum separation of the two components of the H and K lines is observed to be 19 km s^{-1} , which may well be a lower limit. If HD 43819 has a companion which produces the sharp-lined secondary minima in the H and K lines, it must be rather weak-lined or of somewhat later spectral type and less luminous. On the other hand, if the profile variations are due to spectrum variability as seen in many other Ap stars, then the metal lines may be formed over only part of the visible hemisphere. This would reduce the observed line width and permit a reconciliation of the observed maximum separation of the H and K line components and the observed value of $v \sin i$.

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