

Are we justified in ignoring the effects of weak magnetic fields when Doppler imaging Ap stars?

G.A. Wade¹, G.M. Hill², N. Manset², P. Bastien²

¹ Astronomy Department, University of Western Ontario, London, Ontario, Canada, N6A 3K7

² Departement de Physique, Universite de Montreal, CP. 6128, Succ A, Montreal, PQ, Canada, H3C 3J7

Abstract.

When performing surface mapping of Ap stars using the Doppler imaging technique, it is universally assumed that the observed line profile variability is dominated by variations of surface chemical abundance, and contains very little contribution due to magnetic broadening. To test the validity of this assumption, we have acquired longitudinal magnetic field measurements of the Ap star 84 UMa (Doppler imaged by Rice & Wehlau, 1994). By comparing model line profiles computed with and without a magnetic field consistent with these observations, we show that while magnetic broadening is not in general particularly significant, other related assumptions may cause large errors in the scale of abundance maps of Ap stars derived from Doppler imaging.