ABSTRACTS

this case the mass at the gap is inferred to be ~0.62M☉.

For the more metal-rich cluster M3, which has no gap, we
find (using Xe=75, Z=0.005, (CN/Fe)=0) that the mass dis-
tribution is much broader than either M15 group and has a
significant low mass tail. It is possible that M3 has two
mass populations, similar to those in M15, but that they
are not separated.

By putting the HB into the Xeq = Yeq plane it is also pos-
sible to get independent estimates of the distance modulus
and reddening and to investigate details of HB evolution.

Session 7: Young Stars
9:50-5:30 (Cavalier Room)
(Display Session)

07.01
The Van Vleck Observatory T Tauri Monitoring Program:
Season Four

W. Herbst, J.F. Booth (Wesleyan U.)

UBVRI and Hα photometry of 14 T Tauri stars has been ob-
tained during the 1984/85 Milky Way season with the Perkin
telescope at Van Vleck Observatory. A new, automated
photometer head, has been placed in operation, signifi-
cantly improving the ease and efficiency with which data
can be obtained. Program stars were as follows: RY Tau,
TTauri, V410 Tau, SU Aur, CO Ori, OW Ori, V380 Ori, BF Ori,
T Ori, and NV Ori. Some data were also obtained on
AB Aur, AN Ori, IU Ori, and RW Aur. RY Tau was observed
on more than 30 nights and has faded somewhat from its
peak brightness level of 1983/84, although it continues to
be brighter than "normal" (defined as the behaviour of
the previous 20 years). The behaviour of Hα and colors
with brightness has been determined for the program stars
and is used to constrain models of the variability. We
thank the Perkin Fund, Dudley Observatory and NSF for
their support of this program.

07.02
An Observational Test of Pre-Main Sequence Evolutionary
Tracks

M. Wenz, K.M. Strom, S.K. Strom (Five College Astronomy
Dept.), S.C. Wolff (WPO).

CaH (X84) and T10 (~140°) band strengths have been
used to determine surface gravity (g) and effective
temperature (Teff) values for nearly 100 M-type T Tauri
stars located in the Corona Australis, Lupus, Ophiuchus and
Taurus–Auriga dark cloud complexes. In combination with
luminosity estimates, g and Teff permit direct comparison of
the location of individual stars in the H–K diagram with
pre-main sequence (PMS) tracks computed for stars of a
given mass. Approximately 80 per cent of the sample
objects appear to have masses consistent with their
observed location in the L, T plane and with conventional
PMS tracks. However, 20 per cent of the samples have log g
values which suggest significant inconsistencies between
the observed location of the T Tauri stars and the computed
tracks. This latter conclusion may be affected by a)
imprecise extinction estimates b) uncertainties regarding
the origin of the "blue continuum" and chromospheric contribu-
tions to the measured T10 and CaH band strengths and c) possible underestimation of stellar
luminosity where no far-IR measurements are available.

The relative importance of each of these effects will be
discussed.

07.03
Speckle Image Reconstruction of a Northern Optical
Companion to T Tauri

P. Nisenson, M. Karovska, R. Stachnik, R. Noyes (CfA)

A second optical component of the T Tauri system has been

observed by applying speckle image reconstruction tech-
techniques to data recorded November 1983, on the Steward
Observatory 2.25-meter telescope with the Papa two-
dimensional photon-counting detector. This companion has
a separation of 0.27 arcsecond and is located at a position
angle of 358 degrees. We point out that this is not the
radio and infrared source reported to be 0.6 arcsecond
south of the optical T Tau.

Observations were made with a 24-nm-wide filter centered
at 659 nm (includes Hα). At this wavelength, this new
component has an optical magnitude fainter than T Tau by
3.7 magnitudes.

A confirming observation was made in November 1984, on
the Mt. Wilson 2.5-meter telescope. The source was also
observed at 520 nm, where the magnitude difference
appeared to be closer to 5 magnitudes.

In this paper, we will describe these observations in more
detail, and briefly discuss their implications to the T Tau
system.

07.04
UBVRI Photometric Monitoring of the Late-Type
PMS Stars AA Tau, DH Tau, DI Tau, GG Tau, and
HP Tau/G2

A. E. Rydgren (CSC), F. J. Vrba (USNO),
P. F. Chugainov, N. I. Shakhovskaya (Crimean
Obs.)

The T Tauri stars AA Tau, DI Tau, GG Tau, and
the PM S G star HP Tau/G2 were
monitored with UBVRI photometry during the
fall of 1984. Observations were obtained at
the Flagstaff Station of the U.S. Naval
Observatory and at the Crimean Astrophysical
Observatory. AA Tau and DI Tau show periodic
light variations with periods of 8.2 and 7.0
days respectively and full amplitudes in
yellow light of about 1.4 and 0.4 mag. The
brightness variations in DI Tau and GG Tau are
of smaller amplitude, but a power spectrum
analysis indicates a periodicity of about 7.7
days for DI Tau. The PM S G star HP Tau/G2
shows a well-defined photometric period of
only 1.2 days. This star was previously found to be
a nonthermal radio source (Bieging et

Our observations are further evidence that T
Tauri variability is primarily associated with the
rotation of an innerhomogeneous stellar
surface, and that T Tauri stars of late K
and early M spectral type rotate surprisingly
slowly. This work is supported in part by NSF
grant AST-8419356.

07.05
Emission Line Variability of RY Tau, DR Tau and SU Aur

A. Brown (JILA, Univ. of Colo. & NBS), F. M. Walter (LASP,
Univ. of Colo.), K. G. Carpenter (JILA), C. Jordan and P.
Judge (Oxford)

The variations of UV and optical emission line fluxes and
profiles of RY Tau, DR Tau and SU Aur, particularly during
mid-October 1983 are described. The degree of correlation
between changes in lines formed in different atmospheric re-
gions is discussed. For DR Tau an interesting relationship
is presented between changes in chromospheric emission line
profiles and chromospheric and transition region emission
line profiles.

This research was supported by NASA grant NAG5-82.