G-STARS: OBSERVATIONS AND THEORETICAL MODELING

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ABSTRACT. The comparison of spectral energy distributions and synthetic spectra for a few G-giants is presented.

Key words: Stars: late-type giants: spectral energy distribution, synthetics spectra

The preliminary results for G-stars are presented here. The compilative catalogue of stars energy distributions (Dragunova et al., 1994, Komarov et al., 1996) prepared in the astrospectroscopy department of Odessa astronomical observatory with authors' participation is used as observational data. The calculations of synthetic spectra were made by the complex of programs STARSP (Tsymbal, 1994). Parameters for calculations (T_{eff}, lg g, [Fe/H]) were given accordingly to concrete stars and were determined earlier on the base of spectrophotometry and photometry data (Korotina et al., 1988, 1989). The Kurucz's (1979) grid of atmospheric models has been used. Theoretical spectra were calculated in the spectral region 320 - 900nm per 0.1Å and then the values of appearing flux were averaged in 50Å-segments. The results are presented in the figures. All the data in Figures 2 - 5 (spectral energy distribution and theoretical spectra) were reduced to the spectral value in the point λ=715 nm of "a mean G-star".

Some preliminary conclusions may be done:

1). Comparison shows that the T_{eff} of stars may be obtained from theoretical spectra with better accuracy than 150K given by photometry.

2). The theoretical spectra in ultra-violet region are different from observed spectra very much. It is necessary to define the new sources of absorption at this spectral region.

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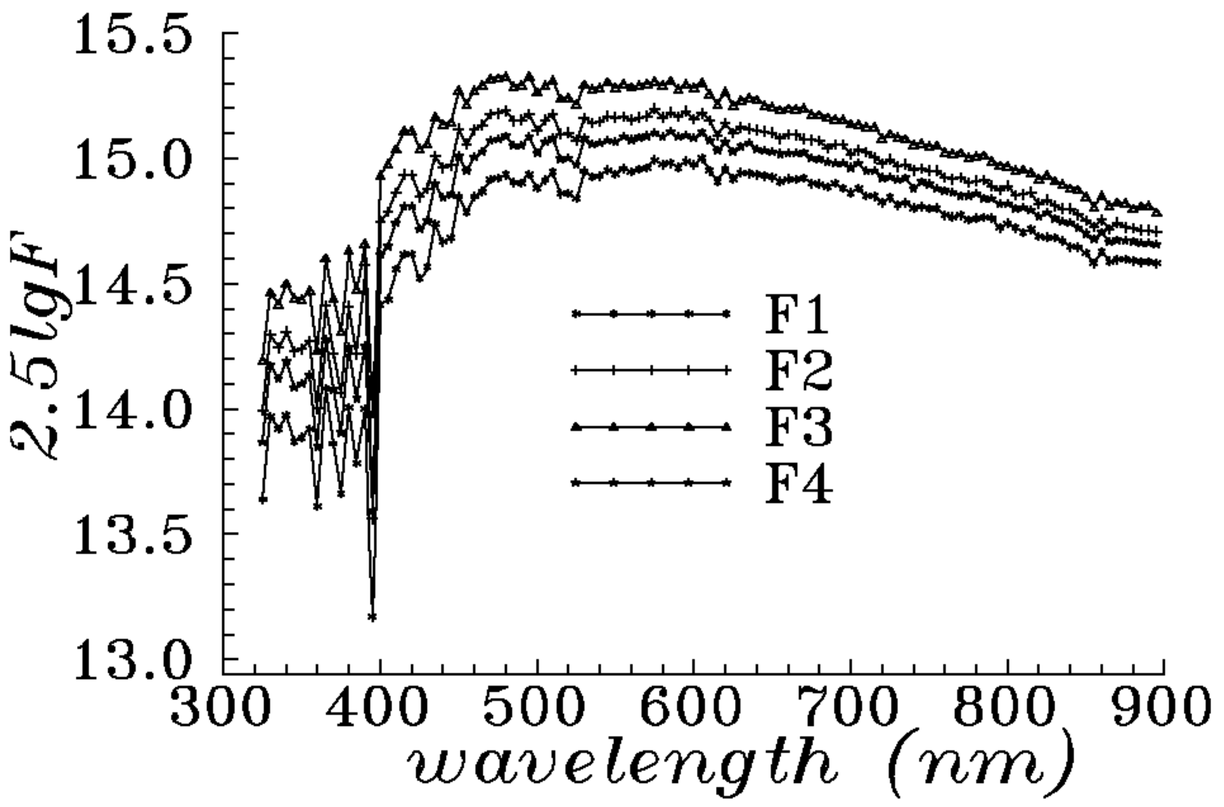

Figure 1. The theoretical spectra: F1 (T_{eff} = 4810K, lg g=2.7, [Fe/H]=0.0); F2(4900, 2.7, 0.0); F3(4960, 2.7, 0.0); F4(5080, 2.7, 0.0).

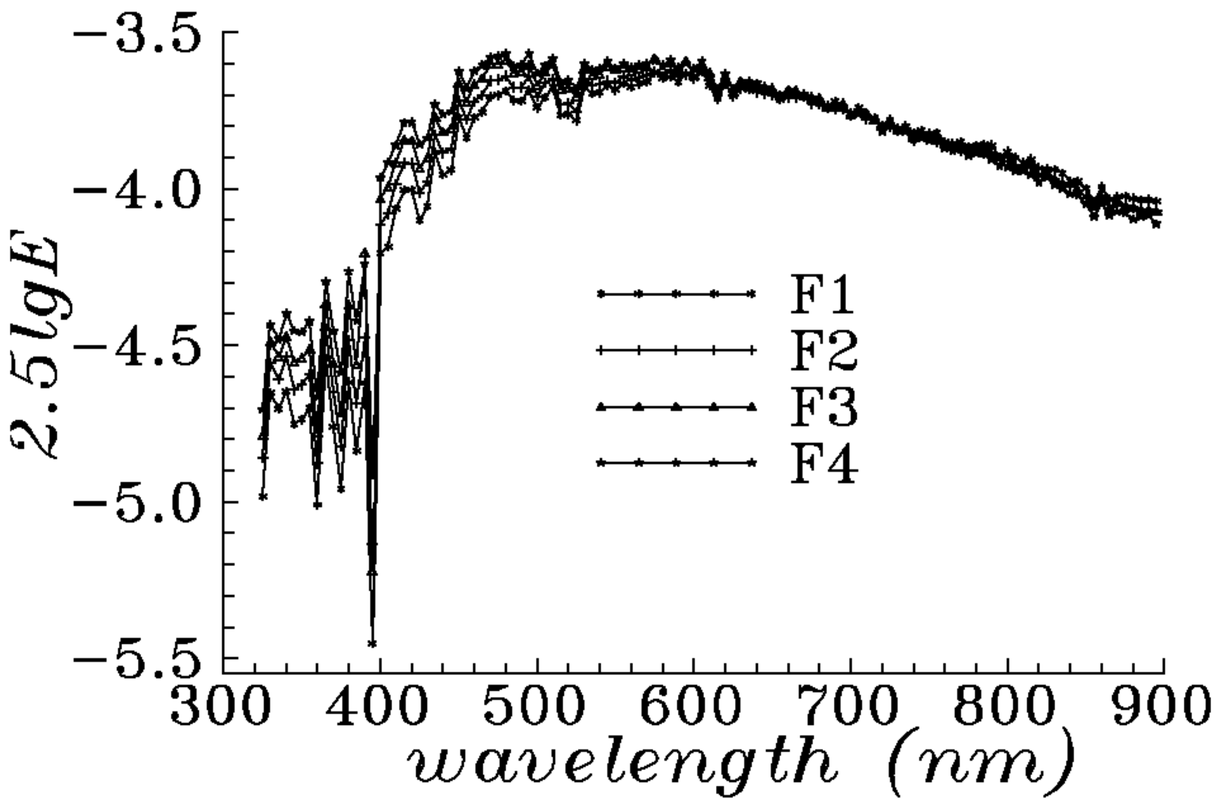

Figure 2. The theoretical spectra F1 - F4 from Fig.1 reduced to mean spectrum of G-star (averaging was made for four stars with parameters: T_{eff}=4960K, lg g = 2.7) in point 715nm.

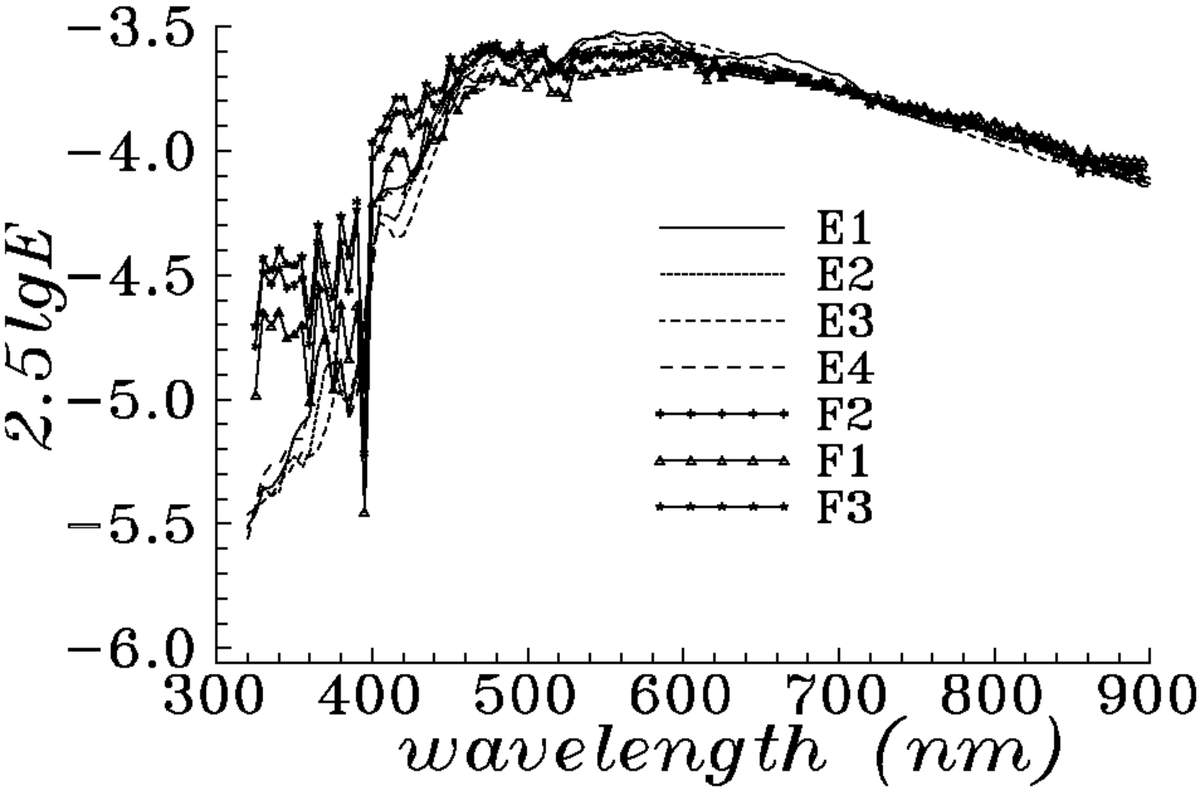

Figure 3.The theoretical spectra F1 (4810, 2.7, 0.0), F2(4960, 2.7, 0.0), F3(5080, 2.7, 0.0) - solid lines and observing spectra of stars: E1(BS1995: G8III, 4960, 2.7, -0.35), E2(BS5602: G8III, 4960, 2.7, -0.23), E3(BS6770: G8III, 4960, 2.7, -0.19), E4(BS8684: K0III, 4960, 2.7, -0.31).

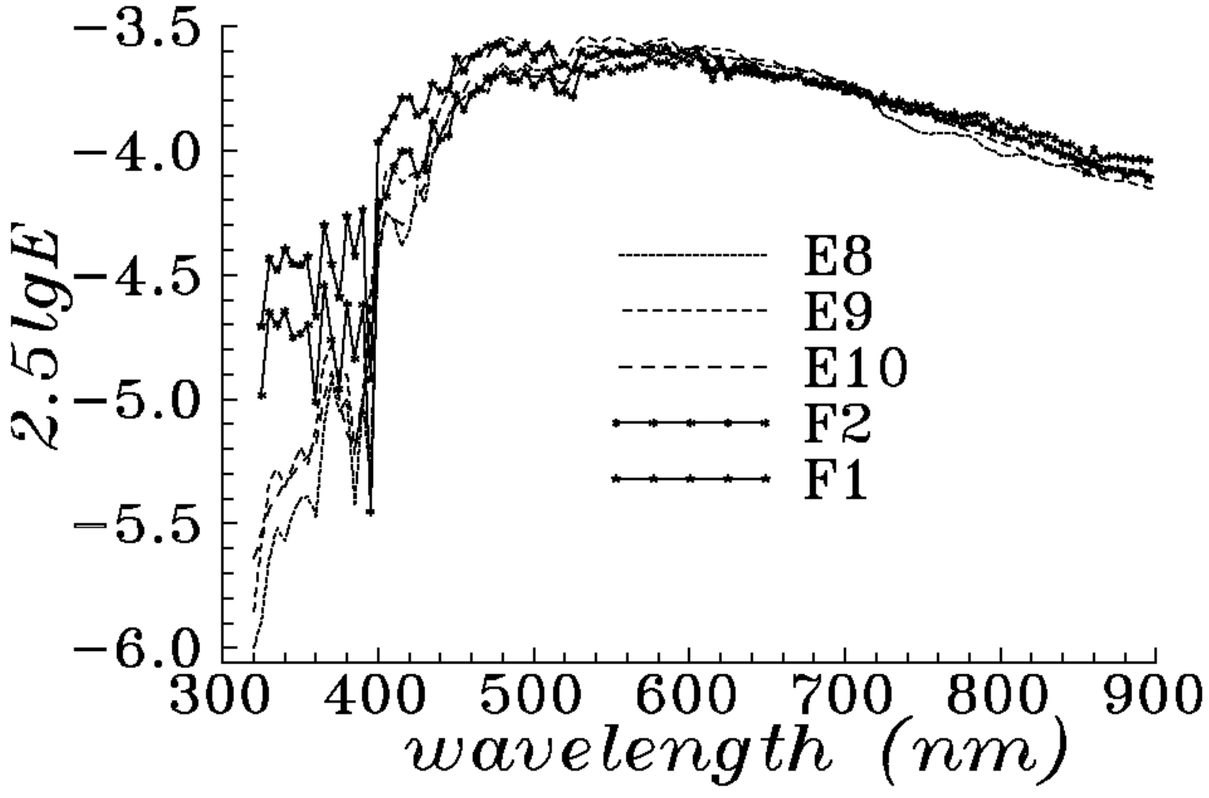

Figure 5. The theoretical spectra F1 (5080, 2.7, 0.0), F2(4810, 2.7, 0.0) and stars: E8(BS1373: K0III, 5080, 2.7, 0.02), E9(BS4932: G9III, 5080, 2.7, -0.14), E10(BS8923: G8III, 5080, 2.7, -0.09).

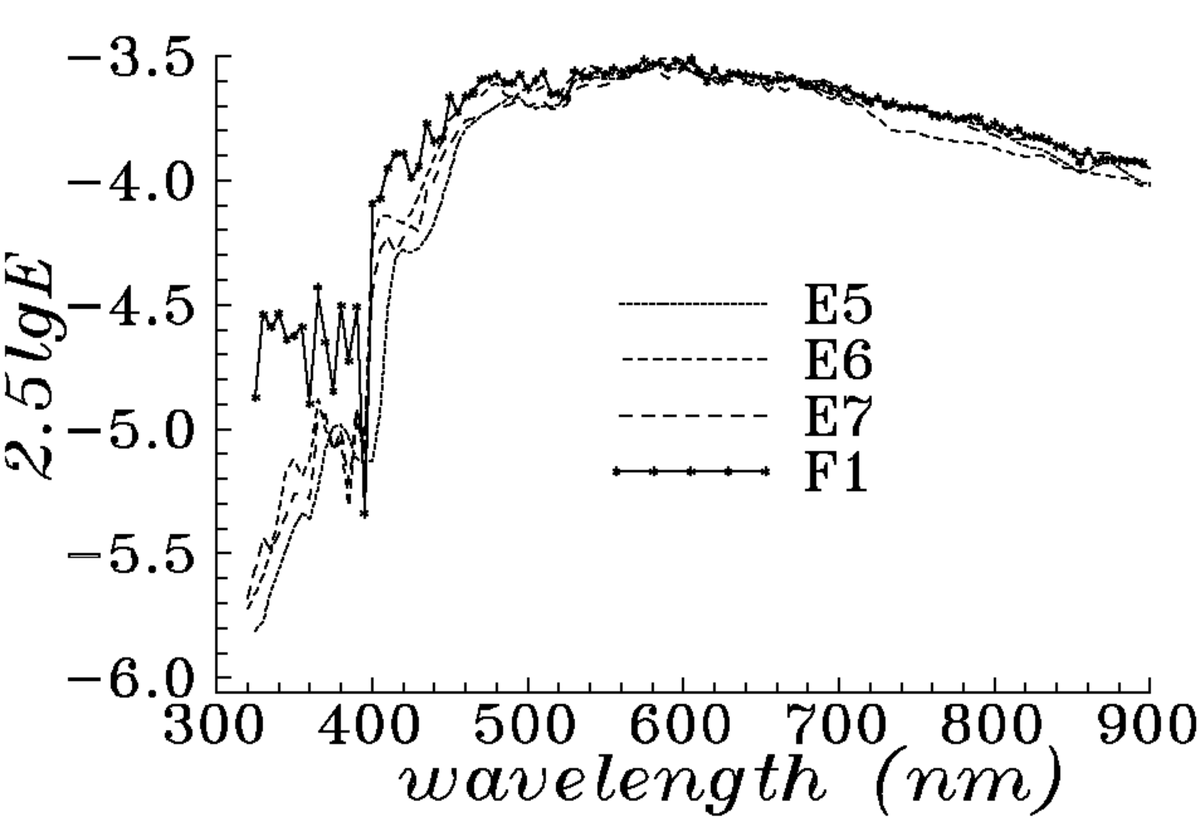

Figure 4. The theoretical spectrum F1 (4810, 2.7, 0.0) and stars: E5(BS442: G8III, 4810, 2.6, -0.42), E6(BS4471: G9III, 4810, 2.6, -0.42), E7(BS5787: G8III-IV, 4810, 2.6, -0.42).

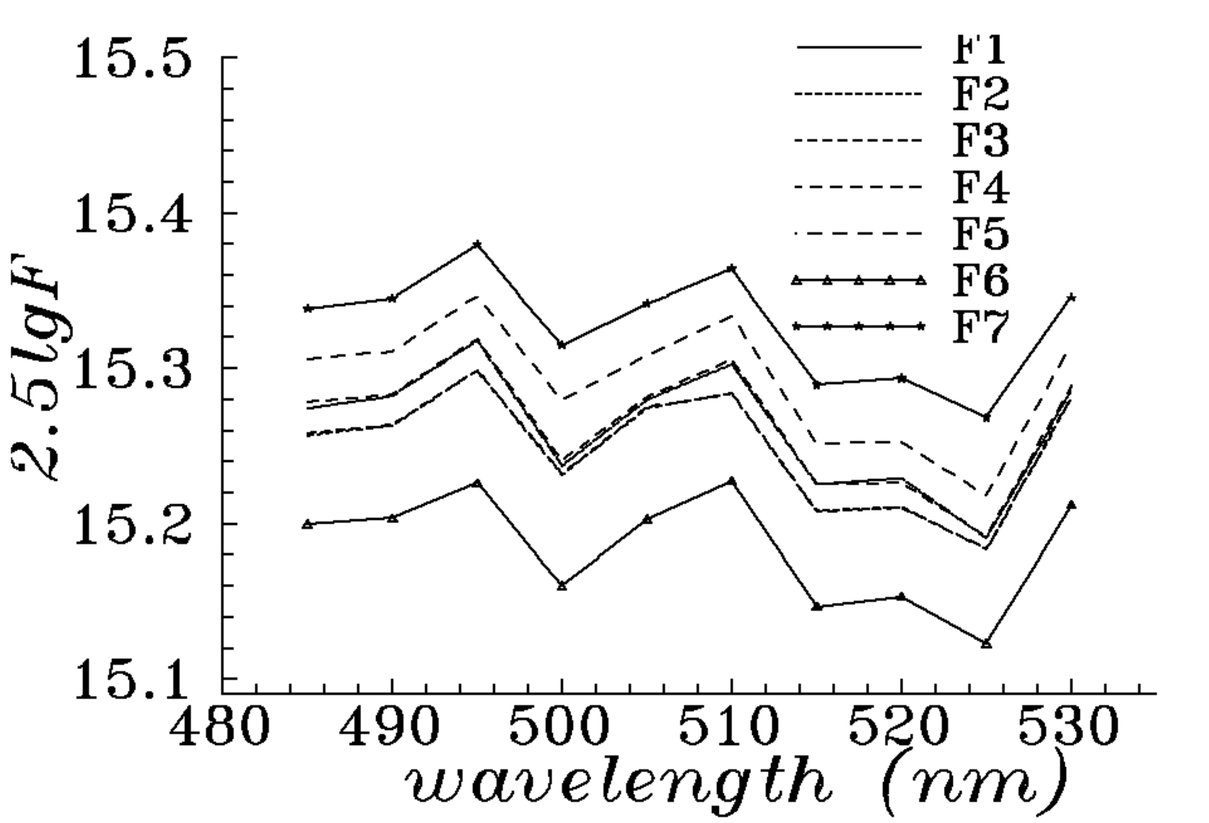

Figure 6. The theoretical spectra, calculated with different values of lg g: F1 (5000, 2.5, 0.0), F2(5000, 2.6, 0.00), F3(5000, 2.7, 0.00), F4(5000, 2.8, 0.0), F5(5000, 2.9, 0.0), F6(4960, 2.7, 0.0), F7(5080, 2.7, 0.0).