

A Pioneer of the Theory of Stellar Spectra – Radó von Kövesligethy

LAJOS BALÁZS, MAGDA VARGHA AND E. ZSOLDOS¹

¹Konkoly Observatory of the HUNGARIAN ACADEMY of SCIENCES

P.O.Box 67, H-1525 Budapest

balazs@konkoly.hu, vargha@konkoly.hu, zsoldos@konkoly.hu

Kirchhoff and Bunsen's revolutionary discovery of spectral analysis (1859) showed that observation of spectra made it possible to study the chemical composition of emitting bodies. Thermodynamics predicted the existence of the black body radiation. The first successful spectral equation of black body radiation was the theory of continuous spectra of celestial bodies by Radó von Kövesligethy (published 1885 in Hungarian, 1890 in German). Kövesligethy made several assumptions on the matter-radiation interaction. Based on these assumptions, he derived a spectral equation with the following properties: the spectral distribution of radiation depends only on the temperature, the total irradiated energy is finite (15 years before Planck!), the wavelength of the intensity maximum is inversely proportional to the temperature (eight years before Wien!). Using his spectral equation, he estimated the temperature of several celestial bodies, including the Sun. As a byproduct he developed a theory of the spectroscopic instruments. He made a comprehensive discussion on the quantitative relationship between the astrophysical spectra and the observer, equipped with some kind of instrument (telescope, spectrograph, detector, etc.). We briefly summarize his main results.