[ST09] The near-infrared tip of the red giant branch as a distance indicator of three nearby dwarf galaxies

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The tip of the red giant branch (TRGB) is the evolution along the RGB ends with a helium ignition in the stellar core. We have estimated the distance moduli for two dwarf ellipticals NGC 147 and NGC 185 and a dwarf irregular galaxy NGC 6822 using the so-called TRGB method to the near-infrared color-magnitude diagrams (CMDs). The TRGB magnitudes in J, H, and K are determined by applying the Savitzky-Golay filter to the luminosity function of the RGB stars. We have also determined the bolometric magnitudes of the TRGB for the galaxies. The absolute magnitudes of TRGBs are estimated from the theoretical Yonsei-Yale isochrones. The obtained distance moduli are (m-M) = 23.87±0.11, 23.62±0.12 and 23.41±0.17 for NGC 147, NGC 185 and NGC 6822, respectively. Our results are compared with the previous values in other literatures. At the point that near-infrared observations are getting important, our study which is about the measurement of distance modulus in the near-infrared band is a good to build the basis for the near-infrared observations.

[ST10] Three Dimensional Radiation-hydrodynamical Simulation for Stellar Surface

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We have investigated the three dimensional radiation-hydrodynamical convection simulation for stellar surface. For low mass stars, stellar surface is a transition layer from convection to radiation in energy transfer. In conventional 1D analysis, it has been included inevitably too many free parameters such as mixing length , micro-, and macro-turbulence without definite physical basis. Because convection and radiation are originally 3D phenomena, it is 3D numerical simulation that enables realistic description for stellar surface. In this paper, we introduce radiation treatment in our hydrodynamical code. Numerical 3D analysis will provide detailed information of thermodynamical structure and line formation.