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Progress Report

EXPLORING THE POTENTIAL OF ASTA SOFTWARE IN ANALYSING BROAD EMISSION AND ABSORPTION LINES

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In this work we present a method for the analysis of emission lines of various astronomical objects, such as Wolf Rayet, Cataclysmic Variable, O, B, Oe, Be stars and quasars, using ASTA software. We focus on spectra in which emission lines are blended with adjacent broad absorption lines forming P-Cygni type profiles. We highlight the ability of the suggested method not only to deblend the emission from the absorption profiles and study them independently but also to analyze these profiles to the individual components they consist of. We are thus able to study each individual emitting/absorbing system in the line of sight and probe its variability in time. We outline the advantages of the suggested method in investigating the variability of individual absorption and emission components of various astronomical objects compared to current complex profile analysis methods. Our recent research work is focused on: (i) The importance of analyzing both emission and absorption lines by using two new mathematical distributions developed by our team, Rotation (R) and Gauss-Rotation (GR). (ii) a new method of measuring the column density of each individual absorption/emission component and probe its time variability between different epochs. Multicomponent fitting of emission/absorption lines have been carried out using ASTA software, a spectral analysis software for displaying, fitting and analyzing astronomical emission and absorption spectra developed by our team.