Physical parameters of Brown Dwarfs in Cha I with VOSA

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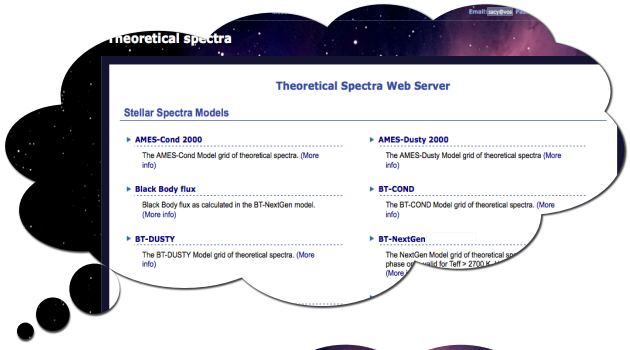
Abstract

The advent of new and more sensitive surveys providing photometry at many wavelength ranges and covering large sky areas (GALEX, SDSS, 2MASS, UKIDSS, AKARI, WISE) and the steady increase of available archival data from ground based observatories are pushing astronomy towards a change of paradigm where small groups, and not only large consortia, need to analyze large multi-wavelength data sets as part of their everyday work. In this context, the Virtual Observatory (VO), as a common frame to exchange not only observational data but also theoretical models, plays a very important role.
This applies in particular to the field of brown dwarfs were the answers to most of the open questions (mechanism of formation, disk evolution, etc.) require the analysis of large datasets of multi-wavelength observations.

We have improved our public web-based Virtual Observatory tool, VOSA, so that it estimates additional parameters (interstellar extinction), accesses new state-of –the-art collections of models, and performs more sophisticated and complete analysis of Spectral Energy Distributions. We show examples of these capabilities analyzing the Cha I population, paying special attention to the substellar population.



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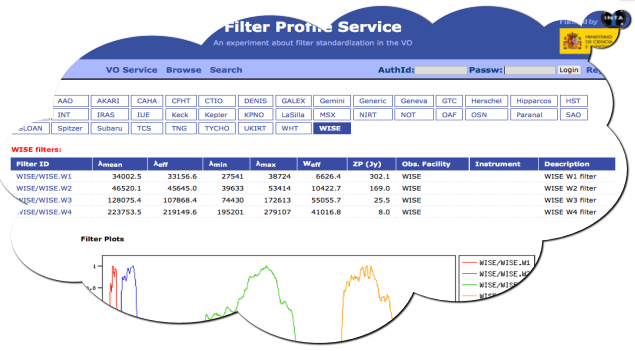
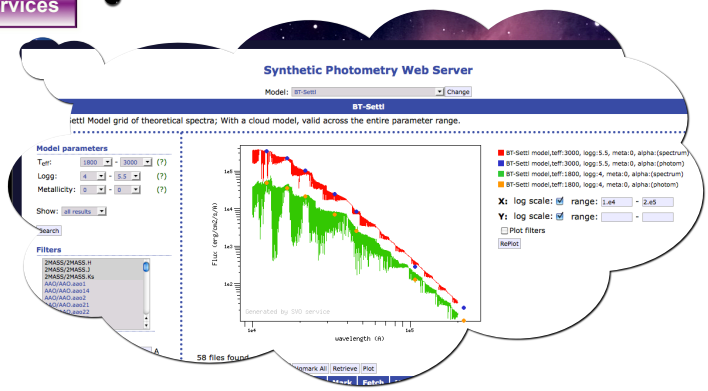
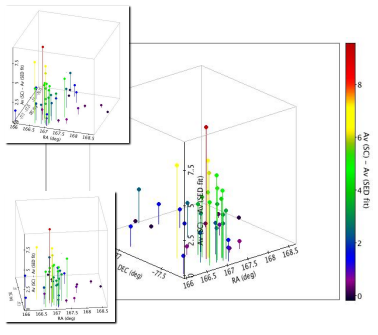
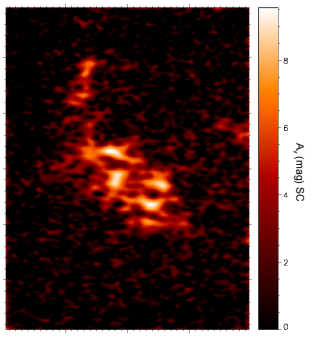




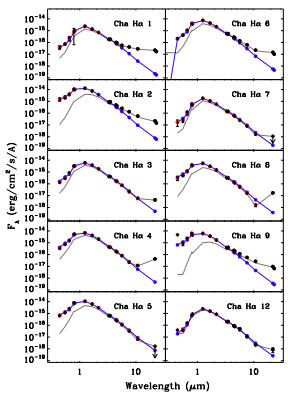
Getting a 3D view of Chamaeleon I

By comparing the extinction estimated from SED fitting with the integrated extinction along the line of sight given by methods like the star counts

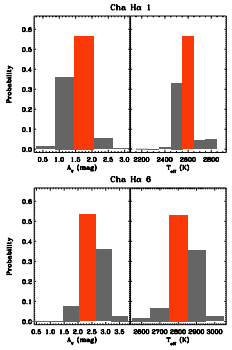




Parameters of BDs in Chamaeleon I



VOSA uses two methodologies: probability analysis of the estimated parameters and χ^2 minimization for a general overview of the fit.



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