VOSA: SED building and analysis of thousands of stars in the framework of Gaia.

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Abstract

VOSA (Virtual Observatory Sed Analyzer, http://svo2.cab.inta-csic.es/theory/vosa/) is a public web-tool developed by the Spanish Virtual Observatory (http://svo.cab.inta-csic.es/) and designed to help users to (1) build Spectral Energy Distributions (SEDs) combining private photometric measurements with data available in VO services, (2) obtain relevant properties of these objects (distance, extinction, etc) from VO catalogues, (3) analyze them comparing observed photometry with synthetic photometry from different collections of theoretical models or observational templates, using different techniques (chi-square fit, Bayesian analysis) to estimate physical parameters of the observed objects (temperature, mass, luminosity, etc), and use these results to (4) estimate masses and ages using collections of isochrones and evolutionary tracks from the VO. In particular, VOSA offers the advantage of deriving physical parameters using all the available photometric information instead of a restricted subset of colors. The results can be downloaded in different formats or sent to other VO tools using SAMP. VOSA is in operation since 2008 (Bayo et al, 2008, A&A 492,277B), with more than 1600 active users ($\sim$5 million objects analysed), and $\sim$ 150 refereed papers published making use of this tool.

We have upgraded VOSA to provide access to Gaia DR2 photometry and parallaxes and give a reliable estimation of the physical parameters (effective temperatures, gravities, metallicities, masses and ages) of thousands of objects at a time. This upgrade has required the implementation of a new computation paradigm, including a distributed environment, the capability of submitting and processing jobs in an asynchronous way, the use of paralelized computing to speed up processes ($\sim$ ten times faster) and a new design of the web interface. (See poster).