JMMC-AMHRA-0000-0001

Revision 1.0

Date: 24/06/2021

JMMC

Quick guide to create AMHRA models

Authors:
Armando Domiciano — OCA-Lagrange

Author: Armando Domiciano Institute: JMMC	Signature: Date: 24/06/2021
Approved by: Armando Domiciano Institute: JMMC	Signature: Date: 24/06/2021
Released by: Armando Domiciano Institute: JMMC	Signature: Date: 24/06/2021

Contents

List of Figures

1 Creating a fits model image with AMHRA

This is a quick guide on how to create models using AMHRA web service from JMMC.

As an example, let us choose DISCO, the real time astrophysical model that can simulate images of the continuum emission from a star surrounded by a gaseous circumstellar disk (free-free and bound-free), such as Be stars or central regions of Herbig Ae/Be.

When going into the DISCO web page one finds all parameters initially set to zero in the form. In order to create a model it is first necessary to fill all the fields with the correct physical, spectral, and numerical parameters. Instead of filling all fields one by one, in this first quick example we will simply (re-)generate the same model as the one offered for download in the description of DISCO: Sample output file (.fits).

To do so, just go to **Submit your request** and click on the **Set** button in front of **Pre-fill the fields with default values**. The form is reload with the parameters set to values corresponding to this default model, as in Fig. 1.

Check all the parameters to understand them and, if necessary, use the tooltips (question mark symbol **?** at the left of each parameter). The **Documentation & acknowledgments** in the top of the page provide links to bibliographic references related to the model, where more detailed information can be found.

We are now ready to create the model by clicking on the **Send data** button at the bottom of the page (Fig. 1). After a few seconds (during which a **Please wait** message appears) we are redirected to the results page of DISCO, which should looks like Fig. 2.

The green Sucess rectangle indicate that the model was successfully computed and is read to be downloaded. Some information is also provided in the **Log** field. Click on the **Download result** button to retrieve the model in .fits format: **output_Disco_*.fits**.

This is an image cube (xy image for several wavelengths) that you can visualize with your favorite tool for fits images. The 5 images span the near-IR domain from 1 to 7 μm (corresponding to the spectral domains of PIONIER, GRAVITY, MATISSE LM). In Fig. 3 we show the corresponding DISCO model image at 2.5 μm. At the bottom header of the fits files also contain a recall of the main input parameters used to create the model. These model images in fits format can be used, for example:

- to prepare observations with ASPRO.
- to compute interferometric observables and directly compare with real interferometric observations using OIFitsModeler.
- as input (prior image) for image reconstruction tools (e.g. OImaging).

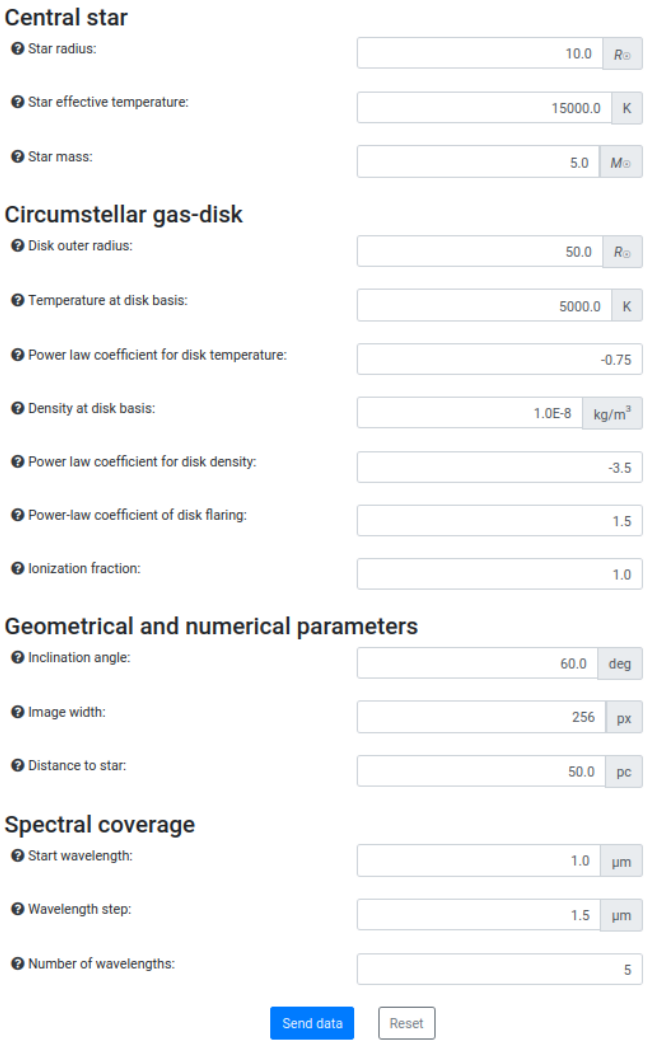

Figure 1: Pre-filled form for the default DISCO model in AMHRA.

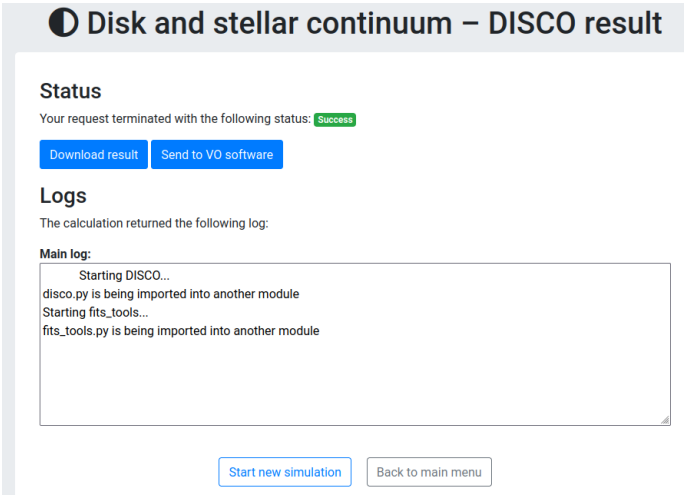

Figure 2: Result page of DISCO model in AMHRA.

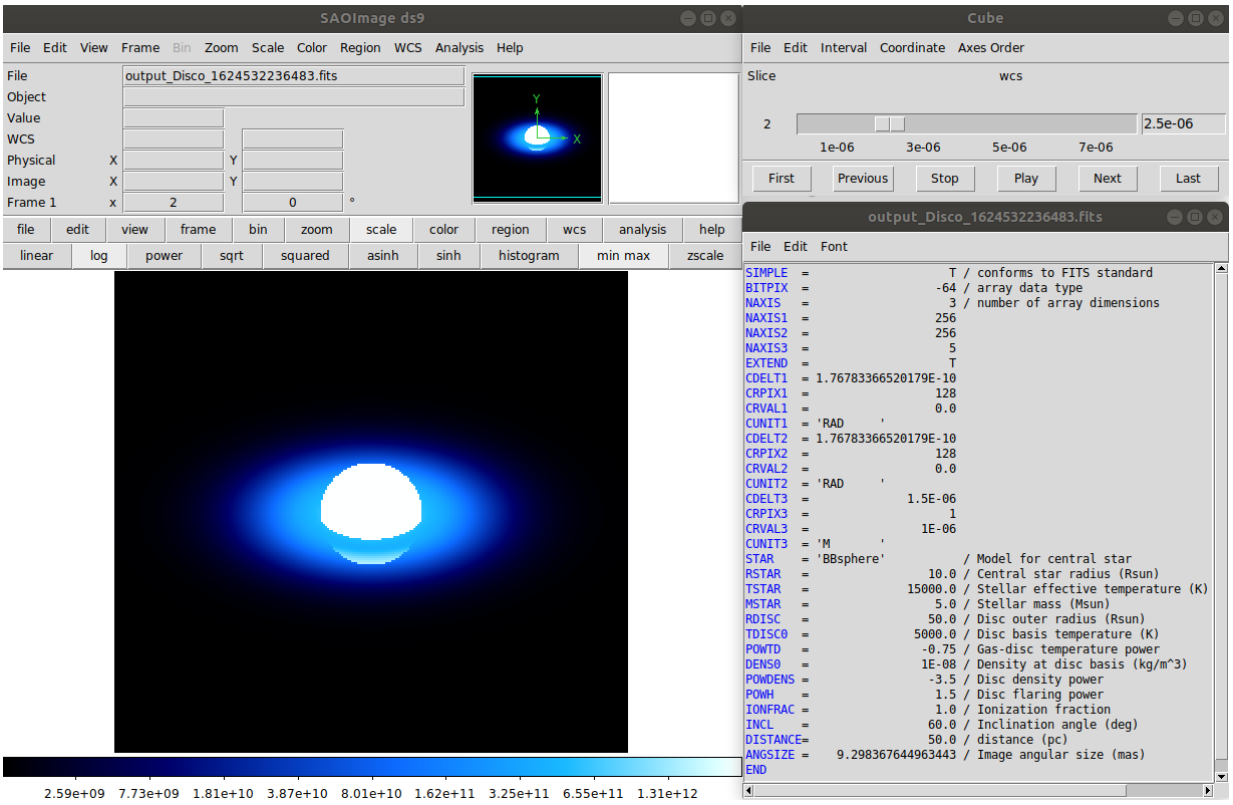

Figure 3: Example of image from output fits file of default DISCO model.