

TOPCAT and Aladin Working Together

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Abstract

One of the greatest achievements of the Virtual Observatory (VO) is the development of standards for how data should look like (data formats and models) and how machines are expected to exchange such data (protocols).

Two applications in the Virtual Observatory can communicate with each other by using the so-called “Simple Application Messaging Protocol”, or short “SAMP”.

This tutorial will show how tabular data can be easily transferred from [TOPCAT](#) to [Aladin](#) or the other way, and it will illustrate the benefits of this inter-client communication for VO users.

Software: [TOPCAT](#), [Aladin](#)

1 Aladin: A1656 and SDSS-DR7

- ▷ **1** Start Aladin and type **A1656**¹ into the textfield behind “Location”. When you press **Enter**, an image from the DSS is loaded into Aladin. Zoom out a bit using the zoom-slider from the right side panel until your image covers about 40’ (you’ll see the approximate size of the part of the sky you’re looking at at the bottom of the Aladin image pane).
- ▷ **2** In Aladin’s menu click on **File** → **Load catalog** → **Surveys in Vizier...** → **SDSS-DR7**. In the “Server selector” window, tick “All columns” and adjust the search radius to 40’. Press **SUBMIT**.

¹A1656, also referred to as the “Coma Cluster”, is a large cluster of galaxies that contains over 1,000 identified galaxies.

2 SAMP Interaction with TOPCAT

- ▷ **3** Launch TOPCAT.
- ▷ **4** Then, in Aladin’s “Stack” (that’s the window on top right showing all downloaded data as a “stack of planes”) right-click with your mouse on **SDSS-DR7** and then choose [Broadcast selected tables to... → topcat](#). If everything goes fine, your table should show up in TOPCAT after some seconds.
- ▷ **5** In TOPCAT’s main window, set [Activation Action](#) to “transmitRow”.
- ▷ **6** Plot the table you received (e.g., [Graphics → Plane Plot](#)), perhaps umag over imag. In TOPCAT’s plot, click on points and see their counterparts in Aladin highlighted
- ▷ **7** Conversely, if you mouse over the dots in Aladin’s image, the corresponding points in TOPCAT are highlighted.

3 Reducing Data in TOPCAT and Sending it Back

- ▷ **8** In TOPCAT, display your table, e.g., by clicking on [Views → Table Data](#).
- ▷ **9** Create a subset of your data that only contains galaxies with known redshifts. For that, select [Views → Row Subsets](#) in the main window, and then in the “Row Subsets” window on [Subsets → New subset](#). Name your subset, e.g. “Galaxies with redshift”. If necessary, column metadata is available through [Views → Column Info](#) in the main menu.
- ▷ **10** For the redshift, filtering is easy: `zsp>0` should do the job. For the galaxies, you have know that the column called “cl” labels the different kinds of objects in your sample. The number **3** is for galaxies. So, type `cl==3 && zsp>0` into the “Expression” textfield.
- ▷ **11** In the “Current Table Properties” box of TOPCAT’s main window, select the name of your subset in the “Row Subset” selector.
- ▷ **12** Click on [Interop → Send table to... → Aladin](#) to bring your filtered catalogue back to Aladin.