Autoplot and Java Libraries for HAPI and Science Processing

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(with contributions from many others)

- This will be an overview of changes in Autoplot this past year.

- There was a more introductory talk at last year's IHDEA meeting:
  https://issues.cosmos.esa.int/socciwiki/download/attachments/42250123/5.4%20autoplot.pdf?version=1&modificationDate=1573127473000&api=v2

- I'll also introduce two libraries which have been extracted from Autoplot which will should be useful to other Java codes on their own.

1-Slide Autoplot Overview

- Autoplot is a Java application for display of data, reading in data from many different sources.

- Data sources are identified by "Autoplot URIs" which are entered in the address bar at the top.

- Data is then displayed as spectograms, lineplots, etc, depending on its structure.

- GUI editors allow scientists to create URIs.

- Lots of analysis can be done, such as slicing data, and also a scripting language (Jython) is provided for creating science workflows.

vap+hapi:http://amda.irap.omp.eu/service/hapi?id=mgs-er-omni&timerange=2006-10-10
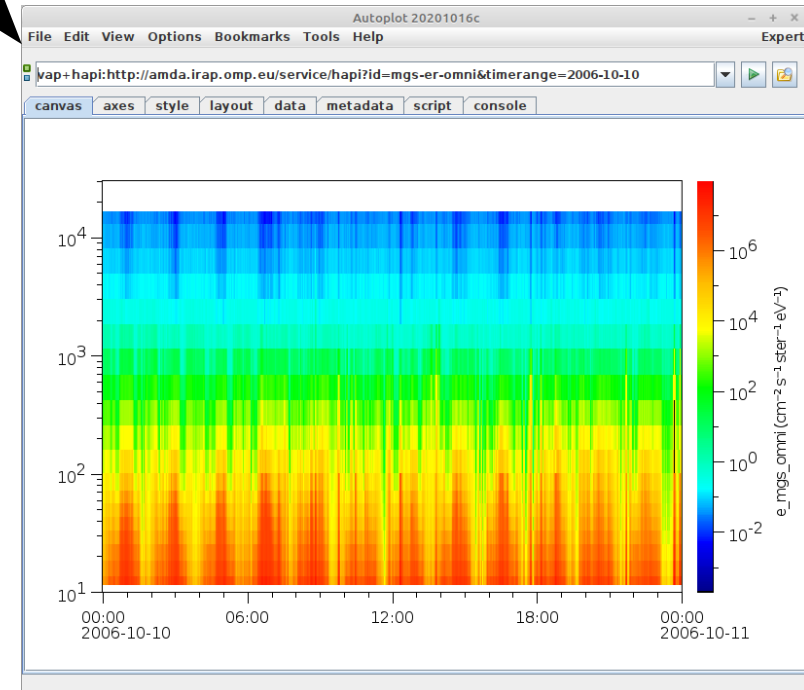
2, I mean, 2-Slide Autoplot Overview

- The URI can be a file on a remote server, and it will be downloaded.

- Autoplot can also take a template specification for filenames, like http://autoplot.org/data/agg/efi/ $Y/po_k0_efi_$Ymd_v$v.cdf? timerange=Jan+2000

- The files within the time range are read in and "aggregated" together.
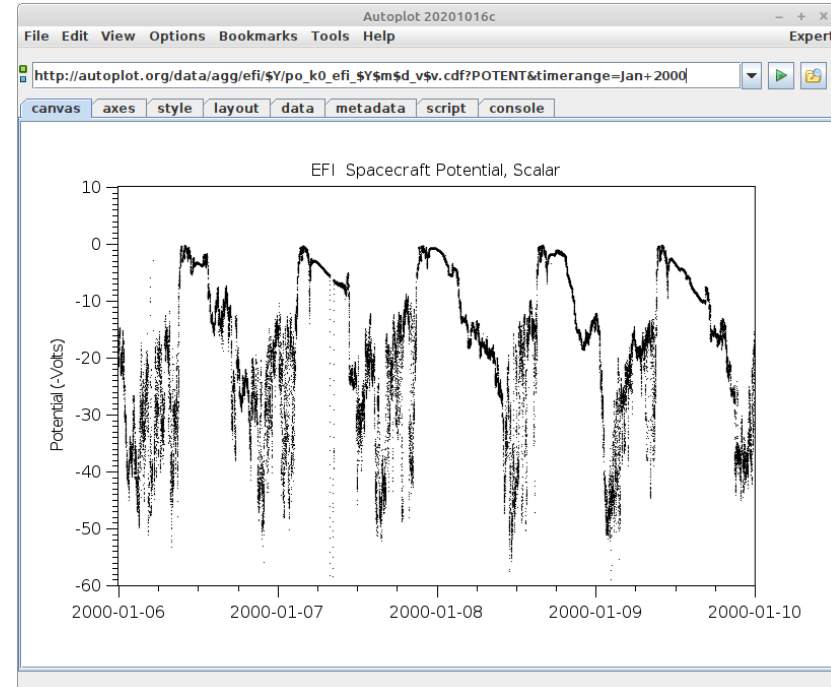
New .dmg and .exe Release Methods
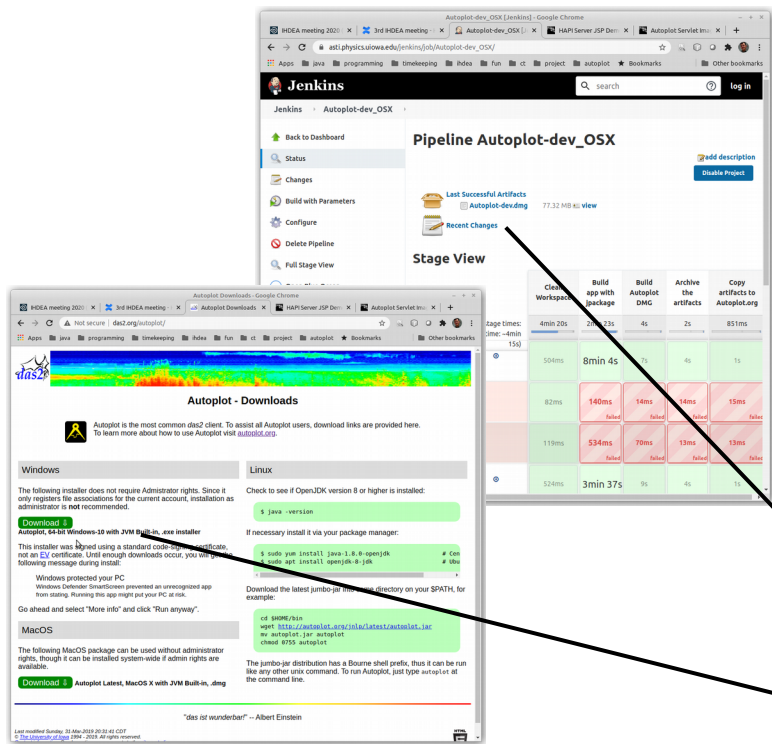
Convenient launchers which have Java embedded within are available. I'll continue to support Java Webstart.

CDF Improvements

- Load/Export multiple variables at once.
  - X,Y,Z
  - Load multiple for efficiency
  - Export multiple for efficiency

- Memory requirements and limitations.
  - 2GBytes per variable should be possible, but this is not coded.
  - Autoplot should support this.
 - Drop support for 32bit machines?

- Waveform Scheme is being adapted, support in CDAWeb
  - Radio and Plasma Waves group at Iowa has been using this form on many missions.
  - Other groups have similar data—to store a timetag for each measurement is very expensive.
  - For example, you have 2-D Voltage[Time,TimeOffset]

- Support similar features in NetCDF. I use a 3rd-party library where I don't have so much control
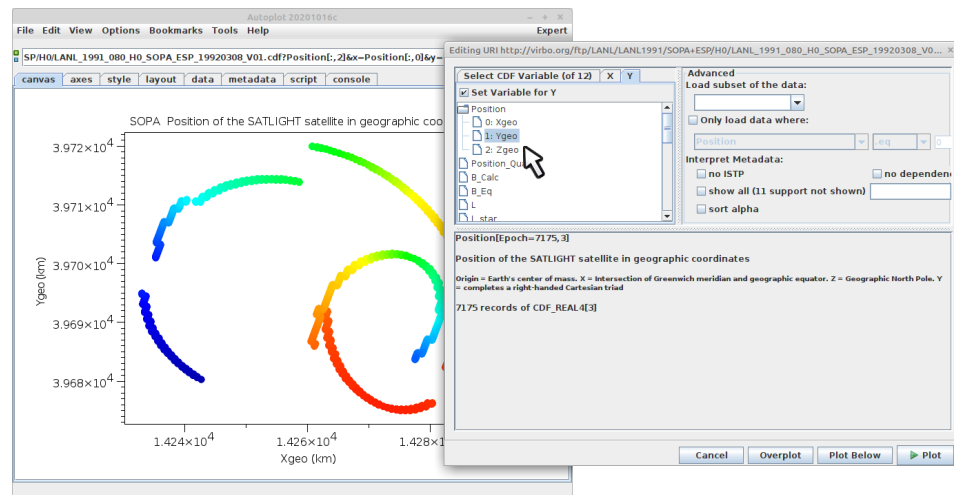
IDLSave and .mat Support

- IDLSave files can now be read
  (you've been able to write for years.)

- Older Matlab .mat
  can now be read and
  written.

- Like with any other file format,
  you can aggregate files, etc.
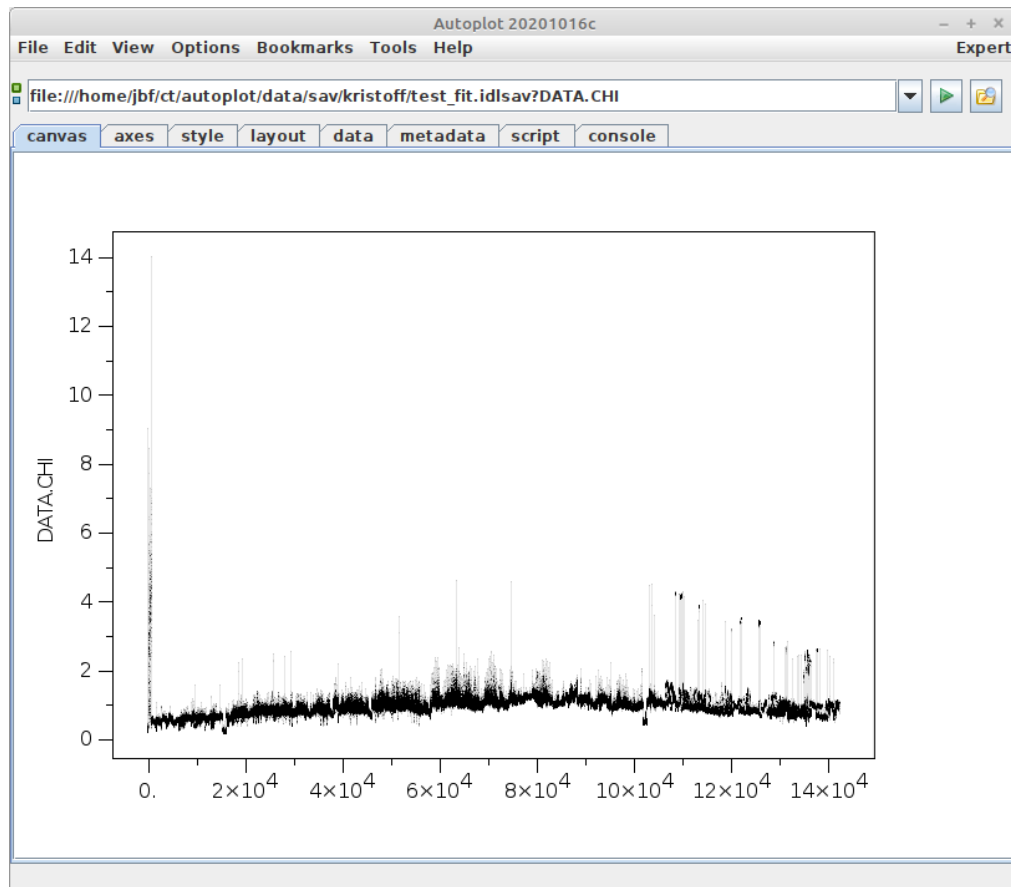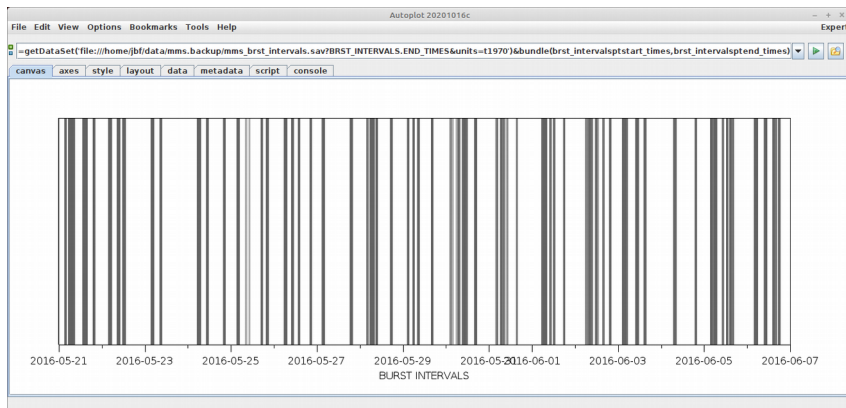
"Basic" Mode Revisited

The goal is to provide a means to "lock down" this flexible app for those unfamiliar with Autoplot.
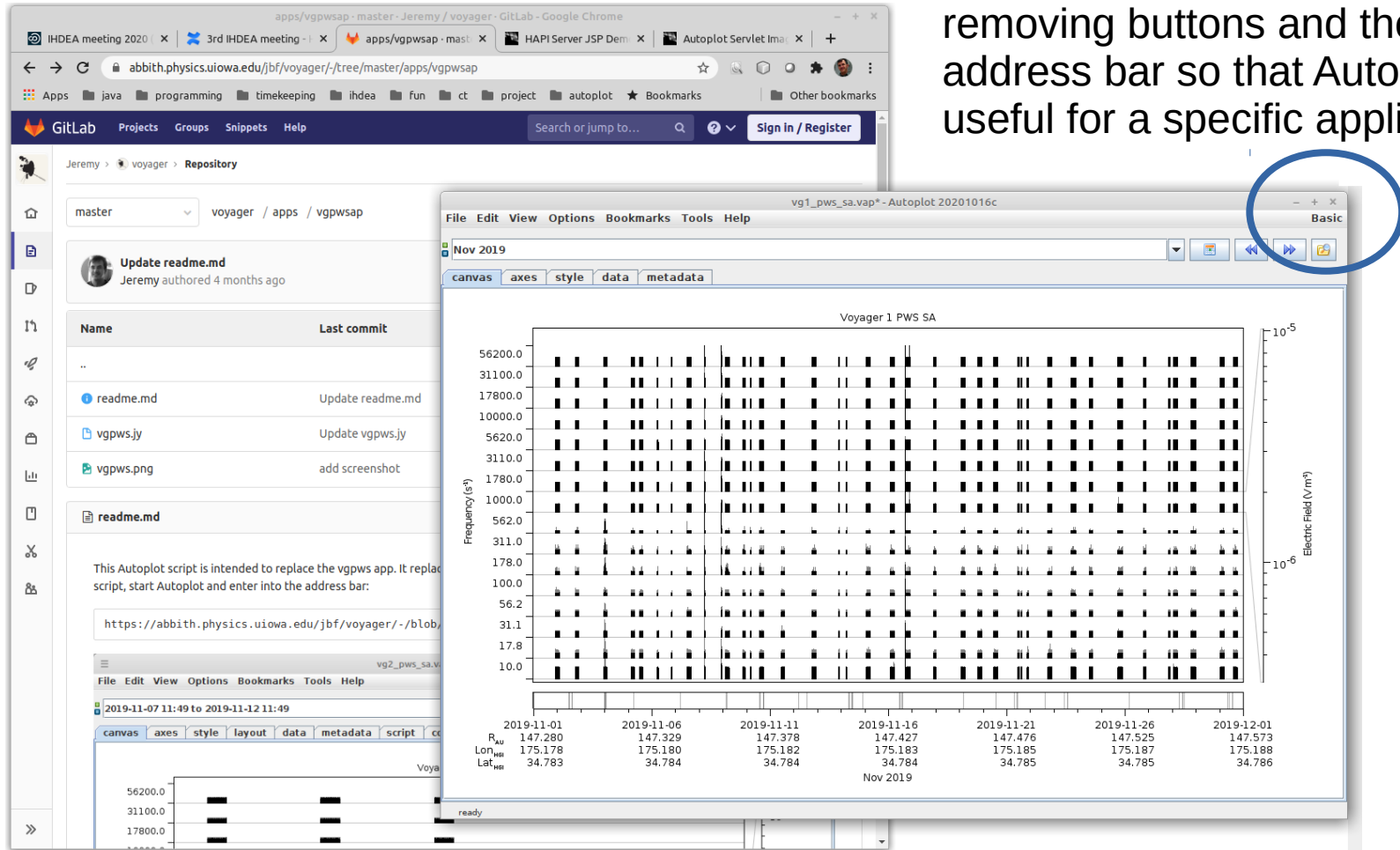
The unfamiliar scientist enters the script address into Autoplot's address bar (or drags the link over), and the app runs.

"Basic" Mode Revisited

Basic mode locks down the app, removing buttons and the address bar so that Autoplot is useful for a specific application.
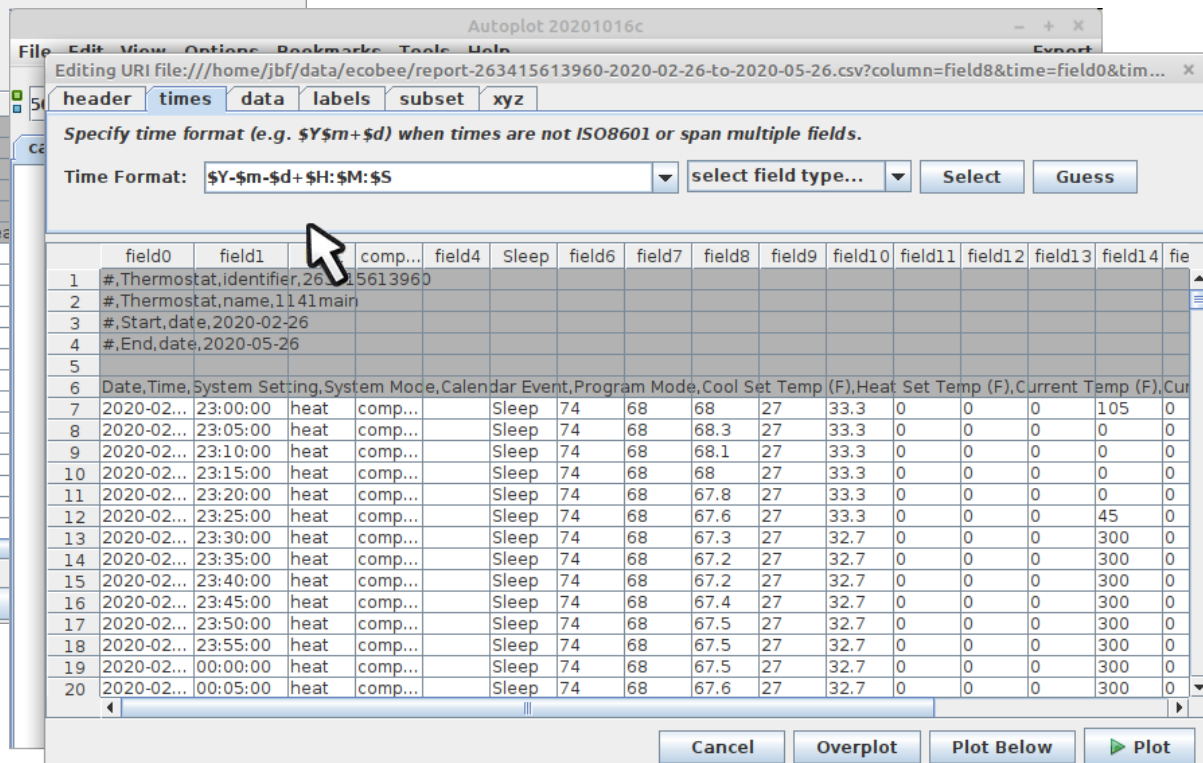
Documentation

- Much of autoplot.org (a Mediawiki site) is being migrated to github. I have been slowly working on new documentation for the scientist-endusers. Feedback and requests are always welcome.

- Github site is full of scripting examples: https://github.com/autoplot/dev/

ASCII/CSV Support

Autoplot's separate CSV and ASCII readers caused confusion for years.
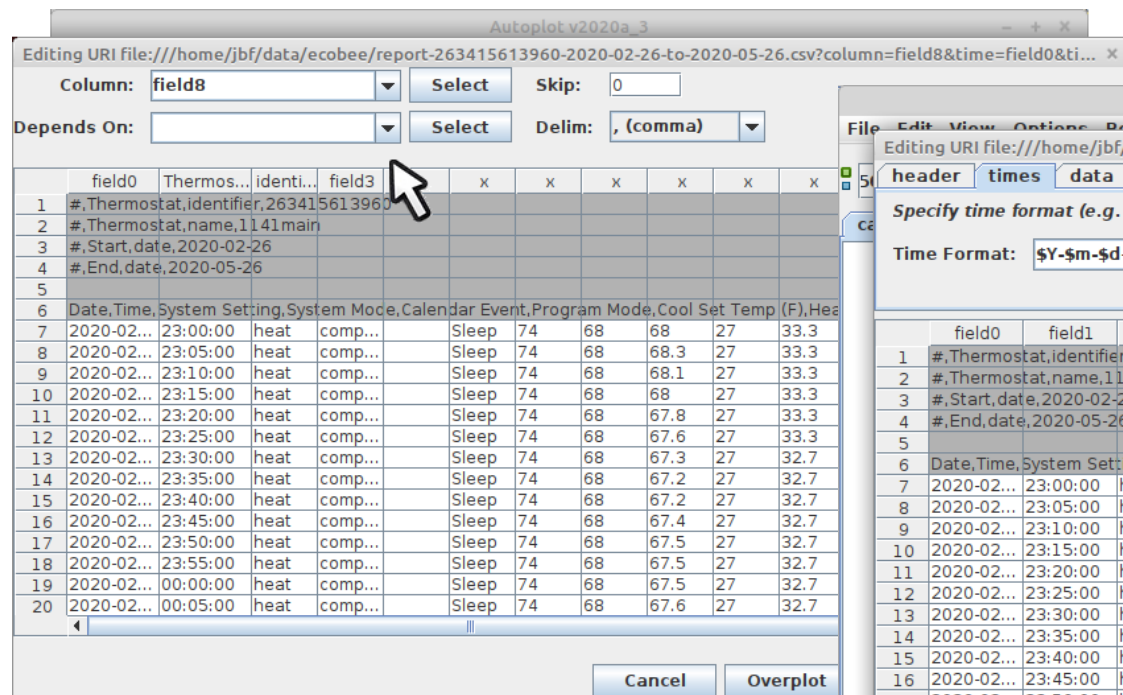
CSV files are supported within the ASCII reader now, having been tested against hundreds of working CSV URIs. (Left is old Autoplot, right is new version.)

URI_Templates Feature Extracted

- Autoplot's aggregation (Ym$d.dat) uses "URI_Templates" and this has been extracted into an independent Java library.

- This also includes a fairly complete time-handling code and is unit-tested with 100% coverage.

- This is described on the other slideshow:

  https://indico.obspm.fr/event/427/contributions/501/attachments/350/497/AutoplotJavaScienceProcessing.pdf

HAPI Client Extracted

- Autoplot has a HAPI client within, but it could not be used independently from Autoplot.

- A clean Java HAPI client has been created as well. This handles client-side caching of data and is to be incorporated into other software systems.

- This is described on the other slideshow as well: https://indico.obspm.fr/event/427/contributions/501/attachments/350/497/AutoplotJavaScienceProcessing.pdf

Thanks!

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