

ASPAS User Guide

Noah Zuckman

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About

Atomic Spectrum Photoplate Analysis Software (ASPAS) is a tool to enable the study of scanned copies of atomic spectrum photoplates from NIST's archive, eliminating the need for a Comparator (Tompkins, 1951). After choosing a bitmap of a photoplate, you can specify the DPI the image was scanned with, record the positions and intensities of emission lines on the photoplate, save recorded data in a text file, and specify an offset for the positions of these lines.

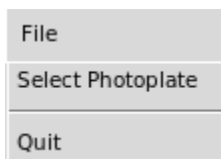
Dependencies

The following Python 3 modules must be installed before using ASPAS:

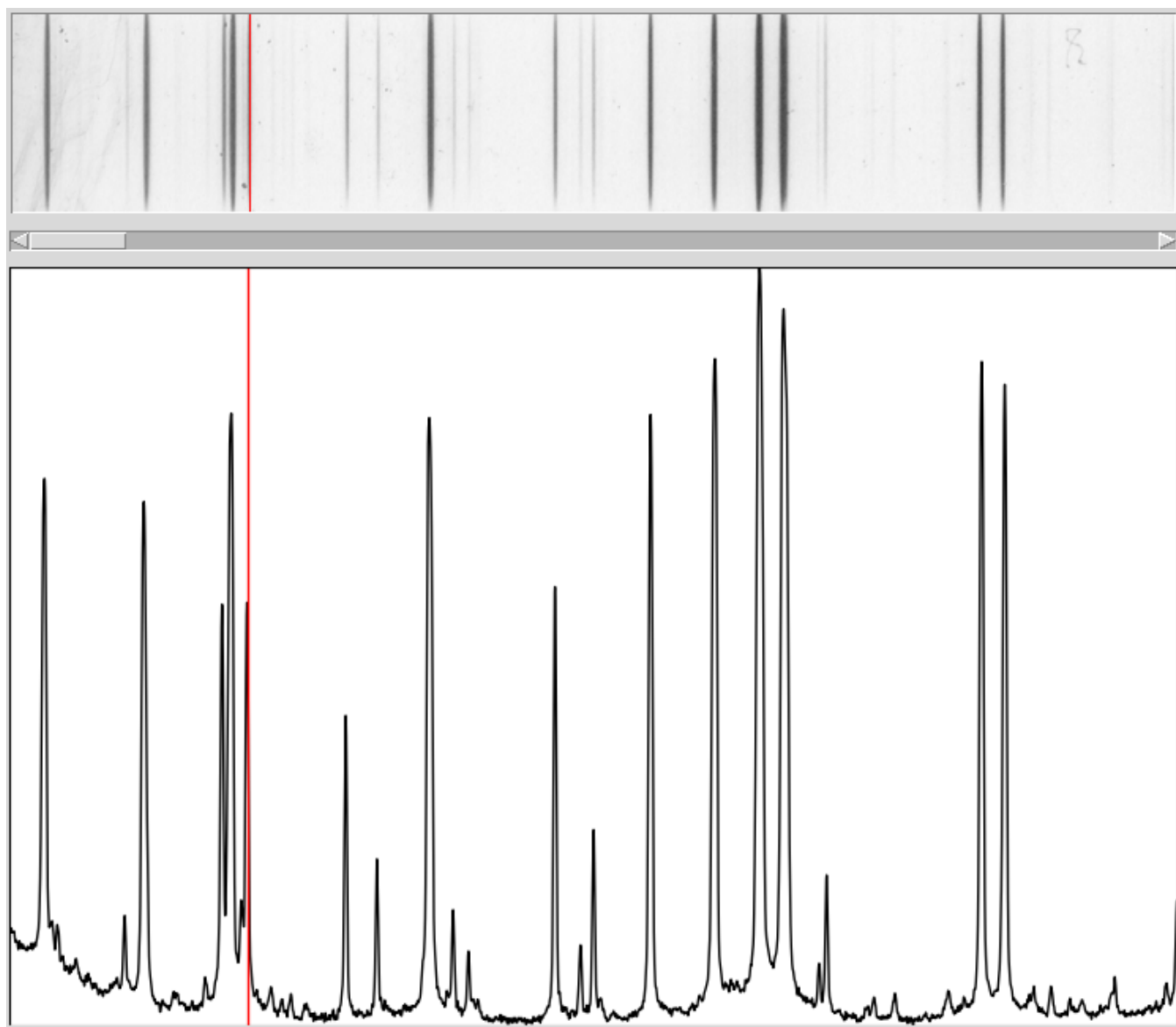
- `matplotlib`
- `numpy`
- `PIL`
- `scipy`
- `tkinter`

Loading a Plate File

Click “Select Photoplate” from the File drop-down menu in the upper left corner:

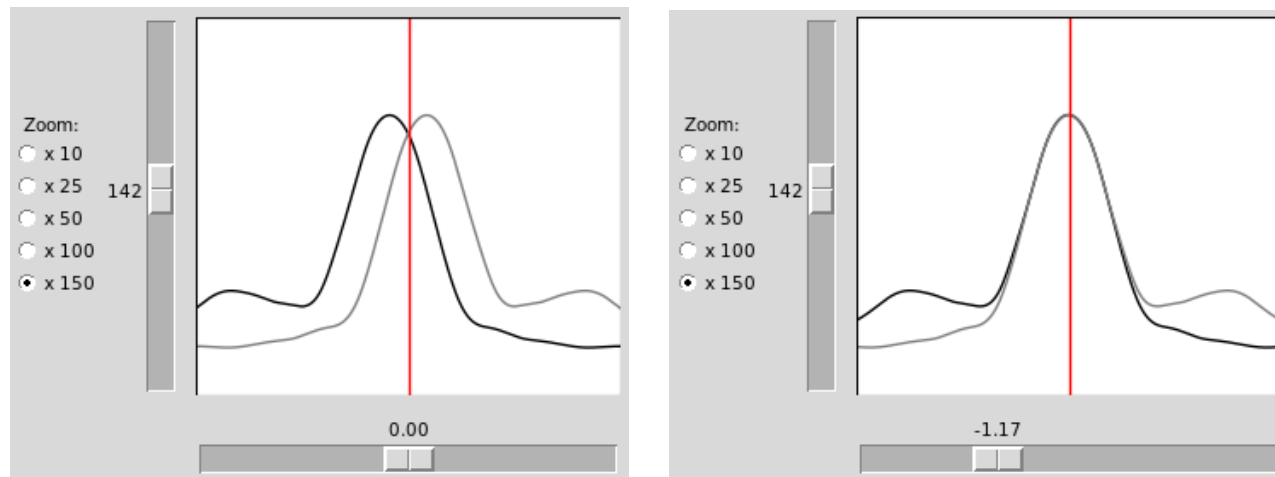


Select a bitmap of a photoplate using the file browser that opens. A section of the photoplate will appear at the top of the window. The scroll bar is used to navigate along the window and display different sections of the photoplate. Click the photoplate or the scroll bar to initialize the scan line and display the line profiles currently in view on the photoplate window. The line profiles are graphed on the center window. Each column of pixels in the bitmap is measured for an average intensity. Cubic interpolation is performed using `interp1d` from the `scipy` module to achieve sub-pixel accuracy. A red scan line will appear to indicate where you clicked on the photoplate:

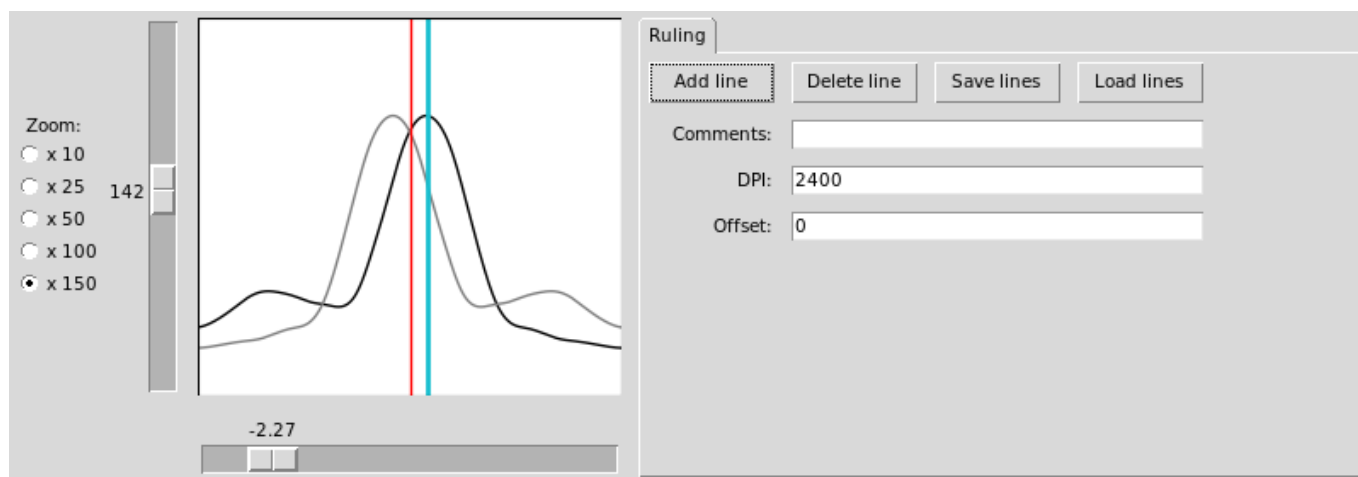


Adding, Saving, Loading, and Deleting Lines

The red scan line indicates where a new line will be recorded. The mirror window in the bottom left corner is used to ensure the scan line is centered on the peak of the line profile. It displays a magnified section of the plate surrounding the scan line, with its mirror image superimposed in gray, as well as a zoom control panel and y -axis slider to the left. The x -axis slider beneath the window is used to precisely adjust the scan line's position after getting it close to the center of a line profile by clicking the photoplate:



Click “Add line” on the bottom right panel to record the position and intensity of this line. A blue line will appear where you have marked this line profile's center, indicating that it has been added to the line list.



A comment can be added to a line when the scan line is directly overlapping it. Type a comment into the “Comments:” entry and press the Enter key to add it to the line. Similarly, a line can be deleted by clicking “Delete line” when the scan line is overlapping it. Clicking “Save lines” will produce a text file detailing the positions, intensities, and comments made on recorded lines. This text file can be loaded back into ASPAS during a later session by clicking “Load lines,” and will show the locations of lines as previously saved.