

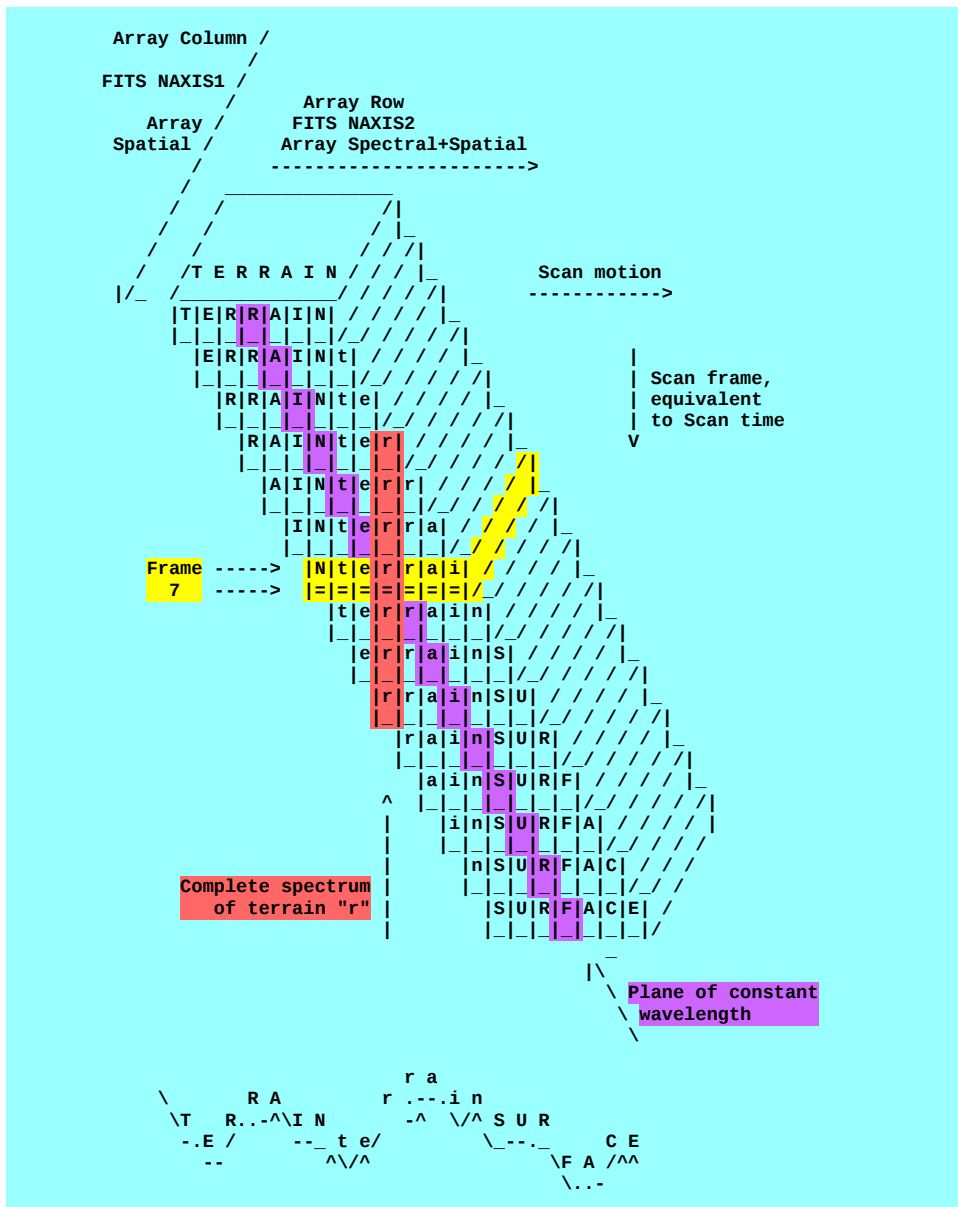
New Horizons LEISA Instrument

The LEISA instrument takes data on a PICNIC array under a wedge filter. The data from each frame is Spatial in one dimension and Spectral+Spatial in the other. The planned mode of taking data is called push-broom which scans the array in its Spectral+Spatial dimension across the target while taking a series of frames over time. The data from a series of frames can then be processed into a Spatial+Spatial+Spectral cube.

1) How data are taken:

In this figure using an isometric view, the data from each array frame exposure are represented as a flat box with its long axes oriented horizontally and into the page; the data from successive frames (times) are shifted vertically down and to the right of the preceding frame. The shift to the right represents the physical scanning of the FOV across the scene terrain (note that LEISA may scan in either direction). The shift down representing successive frames, and time, is conceptual. The terrain being viewed is at the bottom of the figure as well as displayed along the front edge of each frame.

- The array Spatial axis is oriented in-out of the figure (visually bottom-left to top-right in this isometric view).
- The array Spectral+Spatial axis is oriented horizontally (left-right) in the figure.
- Note that in the FITS files, the frames can be visualized as stacked (aligned) vertically over each other in an "image cube," but that doing so offsets the scene one row per frame.
- The boresight, normal to the array frame, is scanned to the right in the figure one Spectral-Spatial row in the time between frames; this time dimension is represented as oriented vertically in this figure as each frame overlaps all but one Spectral+Spatial row of the previous frame.
- Array Frame 7 is highlighted with arrows and with equal signs (=) to aid in identifying its orientation in the stored data product figure in the section that follows.



2) How data may be stored and viewed as a Spatial-Spatial-Spectral 3D cube:

Starting with the figure above and starting from the right, move every column up one with respect to the column to its left, pulling along any columns to its right that have been previously shifted up.

Note:

- a) The Spectral+Spatial axis of Frame 7, horizontal in the figure above and highlighted with equal signs (=), is now sloping up and to the right.
- b) The Plane of constant wavelength, diagonal and sloping up and to the left in the figure above, is now horizontal.

