Isis 3 "qnet" Demo

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Create and Edit Control Networks

Objective

– Learn about the ISIS control network editor "*qnet*"

– Introduction/Demo of editing functionality

- Creating, modifying, deleting control points

- Filtering cubes and control points

- Creating ground control points

- Ground source file vs. radius source file

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Three core windows

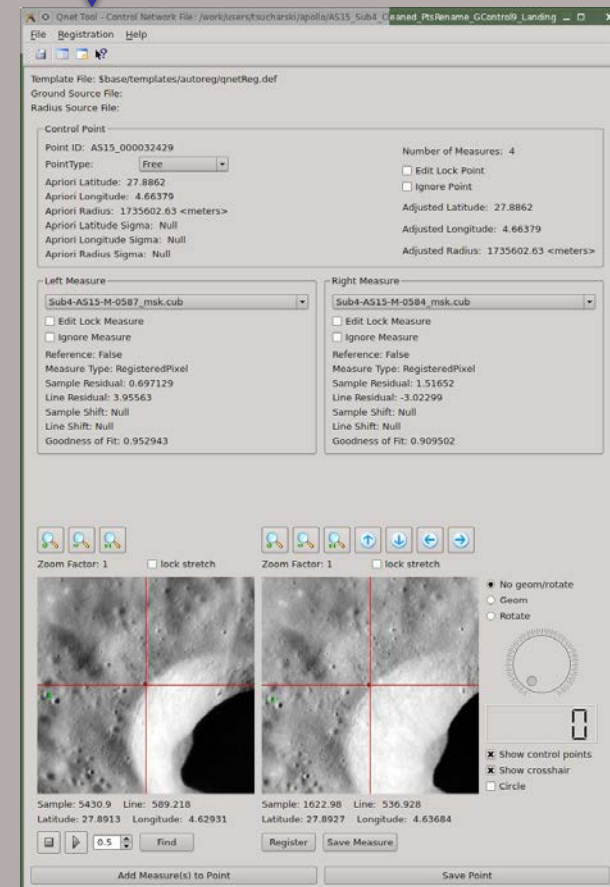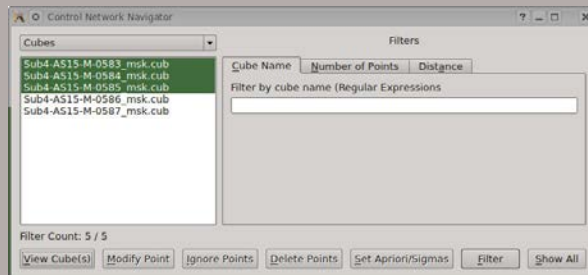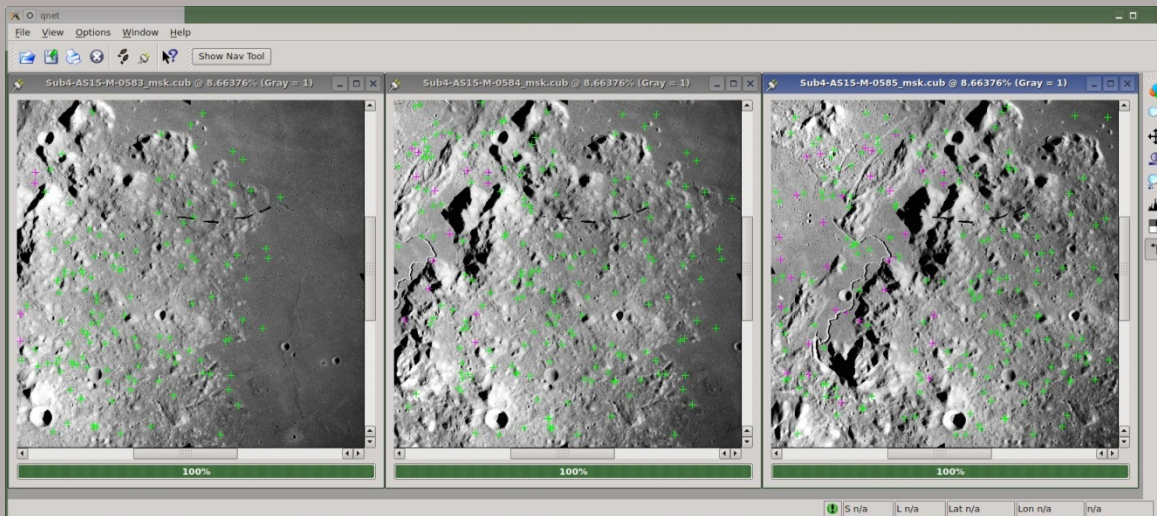Qnet main window similar to qview with most of the same tools
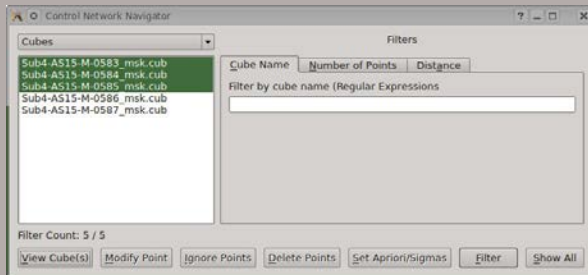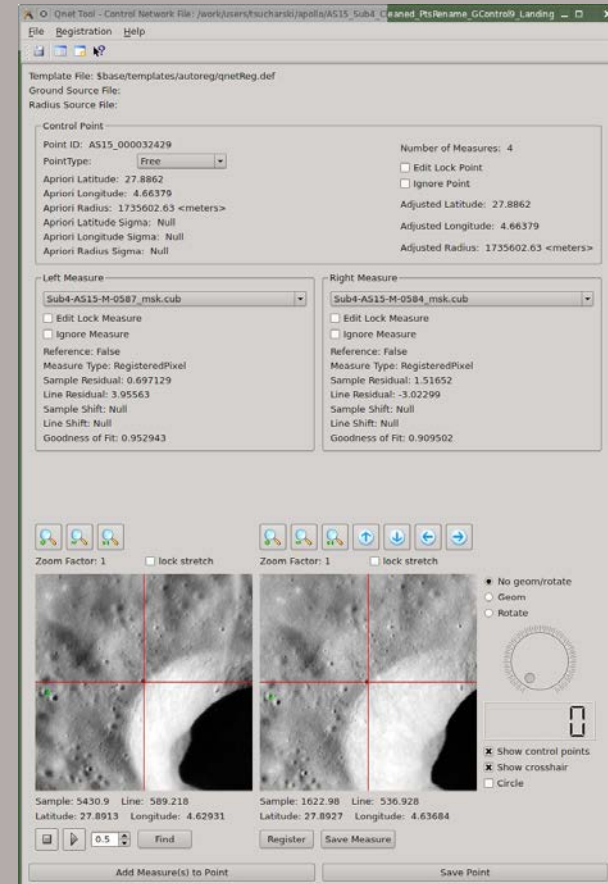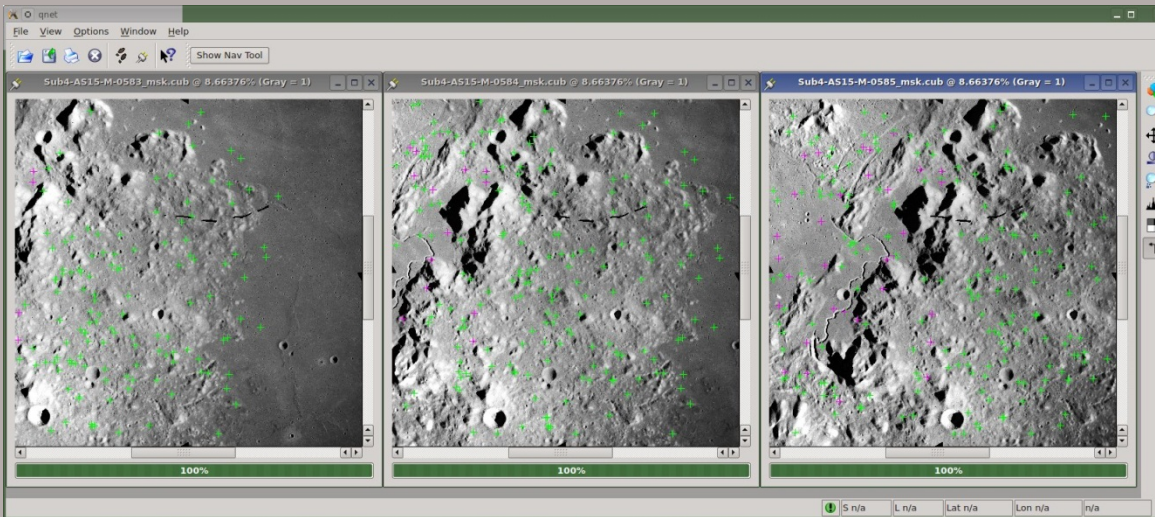
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Qnet tool window – control point editing

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Control Network Navigator Window - Filtering
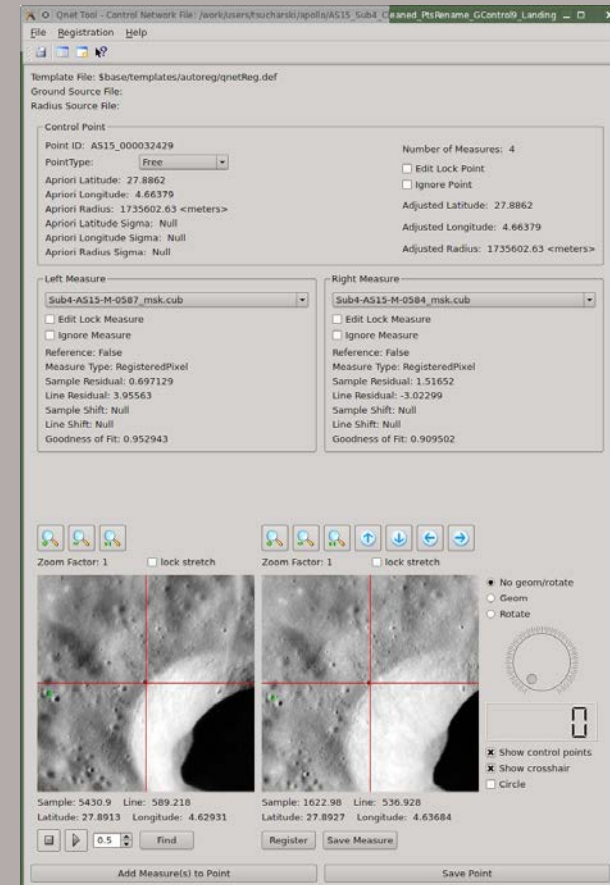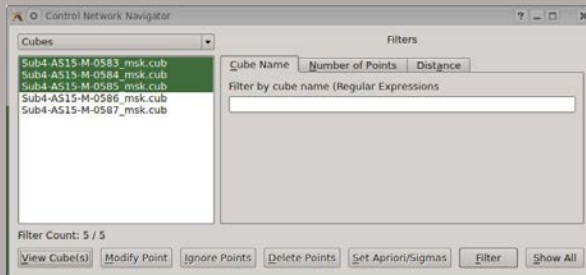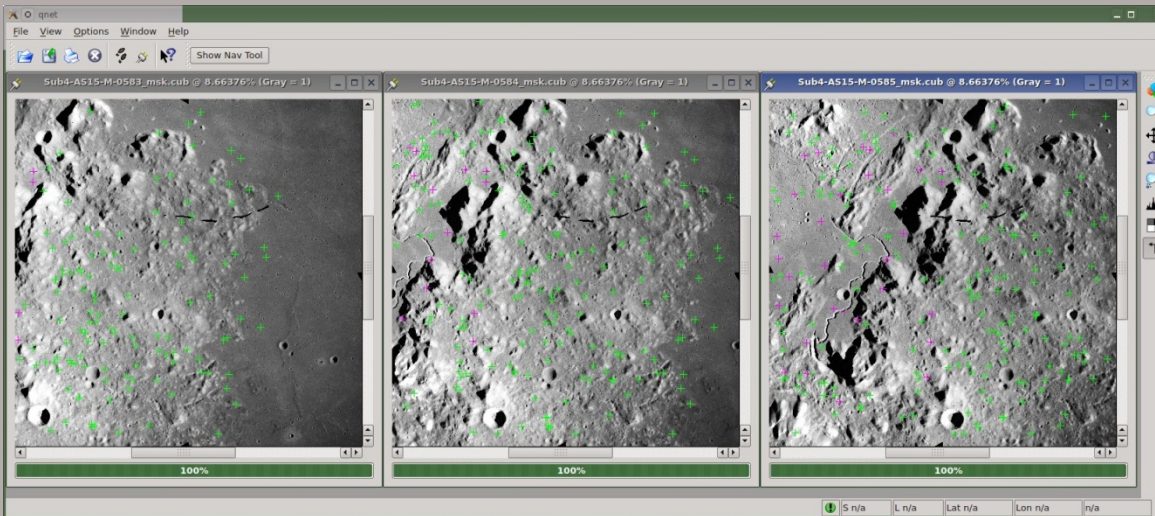
Three core windows +

Measure Table

	FileName	Serial #	Sample	Line	Apriori Sample	Apriori Line	Sample Residual	Line Residual	Residual Magnitude	Sample Shift	Line Shift	Pixel Shift	Goodness of Fit	Ignored	Edit Lock	Measure Type
1	/work/users/tsucharski/apollo/Sub4-AS15-M-0585_msk.cub	APOLLO15/METRIC/1971-07-31T14:01:40.346	589.512	939.075	Null	Null	0.204557	-0.180888	0.273064	Null	Null	Null	Null	False	False	Manual
2	/work/users/tsucharski/apollo/Sub4-AS15-M-0587_msk.cub	APOLLO15/METRIC/1971-07-31T14:02:27.179	3157.68	934.802	Null	Null	0.199747	0.0973928	0.222226	Null	Null	Null	0.923167	False	False	RegisteredPixel
3	/work/users/tsucharski/apollo/Sub4-AS15-M-0586_msk.cub	APOLLO15/METRIC/1971-07-31T14:02:03.751	1861.06	929.814	Null	Null	-0.402641	0.0816931	0.410845	Null	Null	Null	0.947498	False	False	RegisteredPixel
4	/work/users/tsucharski/apollo/lroWacSub.cub	lroWacSub.cub	1056.91	330.781	Null	Null	Null	Null	Null	Null	Null	Null	Null	False	False	Candidate

Simply a table of control measures for the current edit point. It is sortable by clicking on column headings.

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Qnet main window similar to qview with most of the same tools, ie. Zoom, stretch, pan
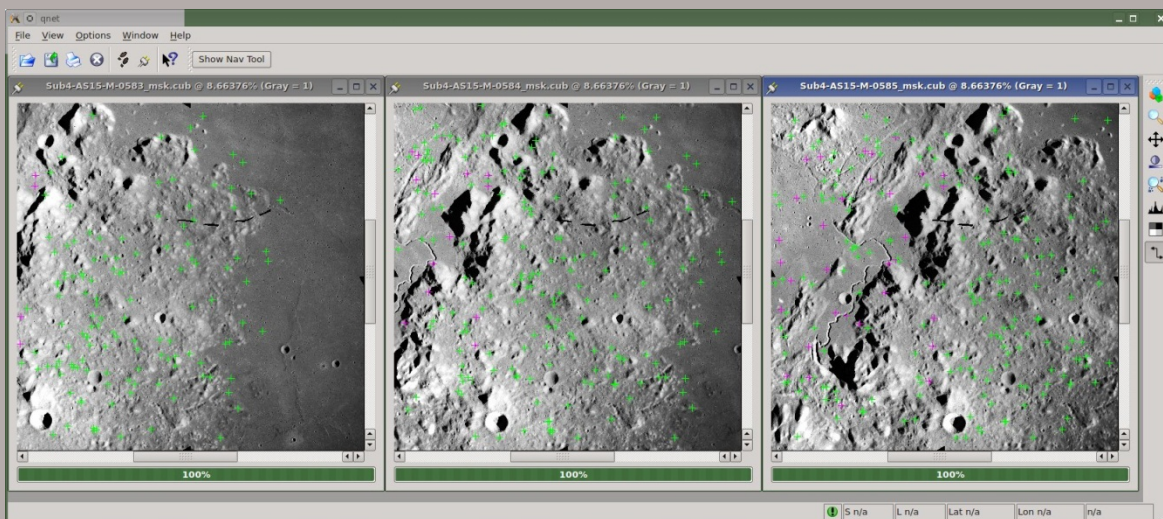
Mouse button functions:
- **Left**: Modify the closest control point
- **Middle**: Delete the closest control point
- **Right**: Create new control point

Cubes displayed through two methods.
- Select a Point Id from Control Network Navigator window, then select "View Cube(s)"
- Select Cubes from the combo-box at top of Control Network Navigator window, then double-click on cube filename

Control Points drawn on cubes with the following colors:
- Green "+" tie point
- Magenta "+" ground point
- Yellow "+" ignored point
- Red "+" point currently being edited (i.e. in Qnet Tool window)

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Qnet tool window – control point editing

Menus / Toolbar:
- File
  - Open ground source
  - Open radius source
  - Save control network
- Registration – Applicable to sub-pixel registering measures
  - Open registration template
  - View/edit registration template
  - Save registration chips
- Help
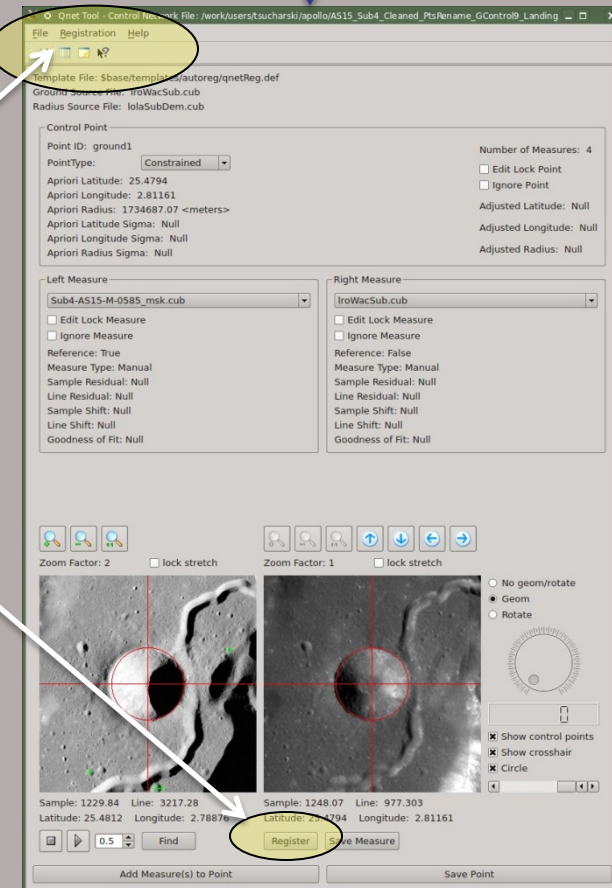
Three core windows
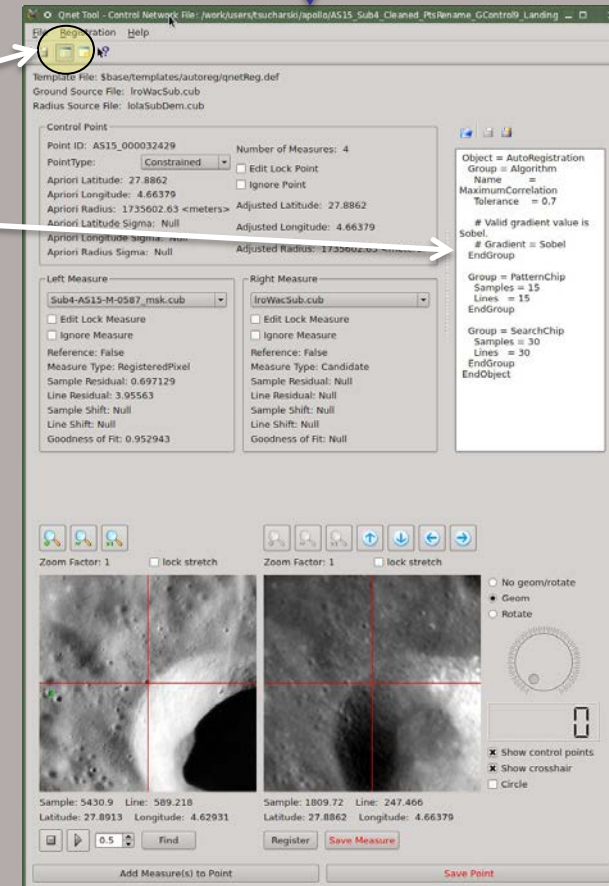
Qnet tool window – control point editing

Registration Template:
- View and/or edit the registration template
  The registration template is shown in an editable window.
  These parameters can be changed and saved for sub-pixel
  registering the right measure to the left measure.

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Qnet tool window – control point editing

Control Point Information

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Qnet tool window – control point editing

Control Point Information
   Change point type

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Qnet tool window – control point editing

Control Point Information
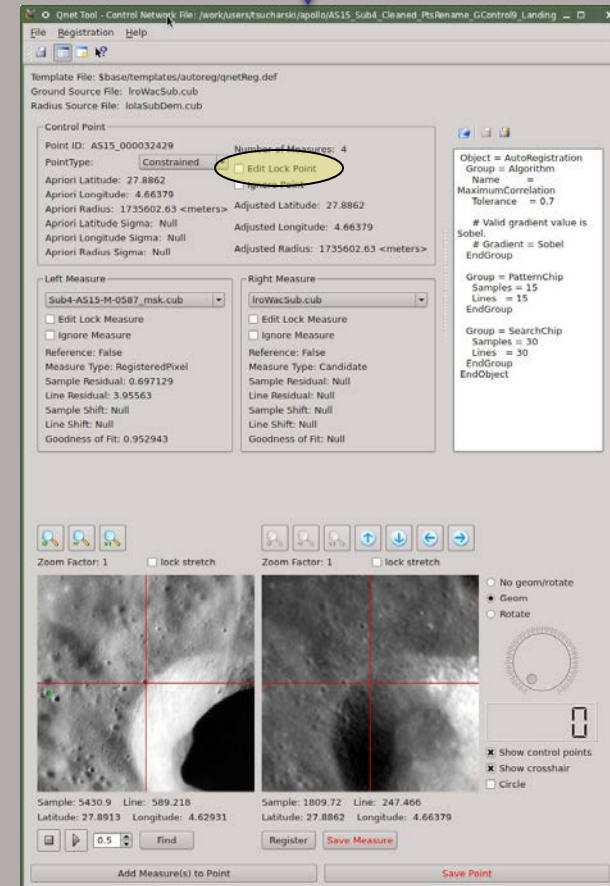Change point type
Change edit lock status

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Qnet tool window – control point editing

Control Point Information
  Change point type
  Change edit lock status
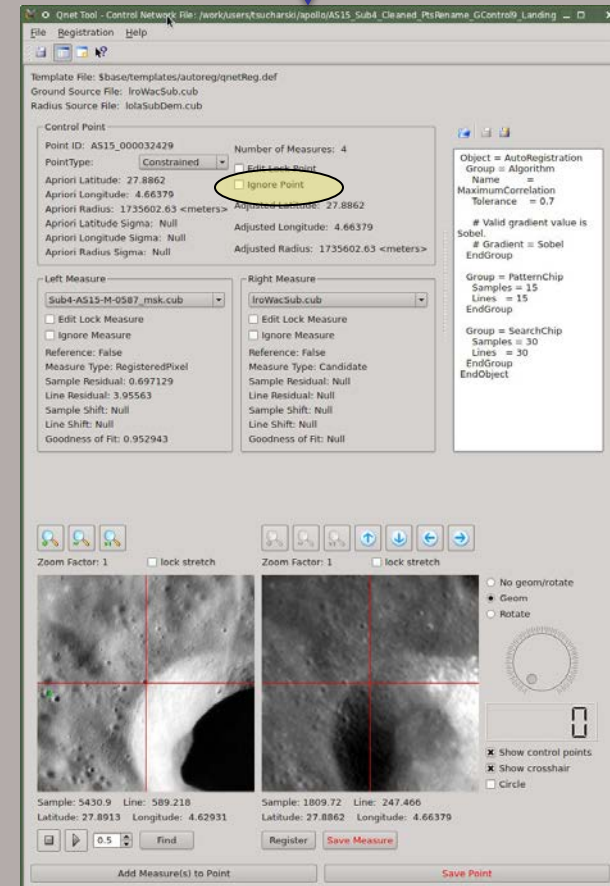 Change ignore status

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Qnet tool window – control point editing

Measure Information

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Qnet tool window – control point editing

Measure Information
Change which measures are displayed

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Qnet tool window – control point editing

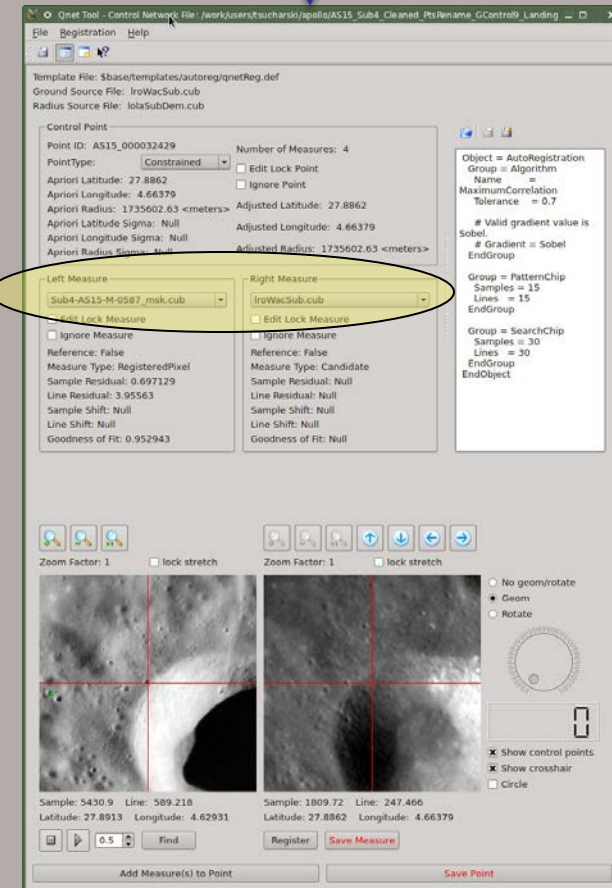**Measure Information**

Change which measures are displayed

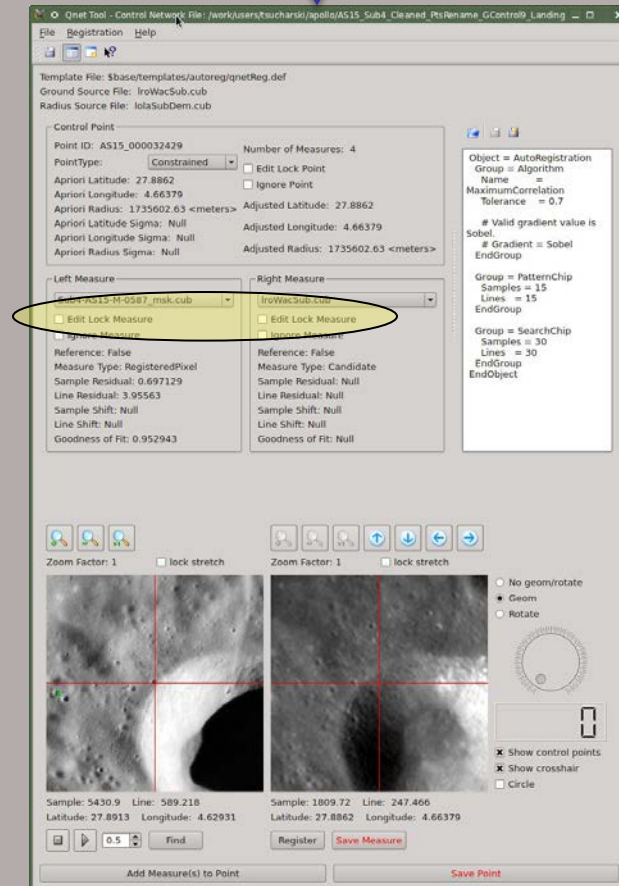Change edit lock status

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Qnet tool window – control point editing

Measure Information

Change which measures are displayed

Change edit lock status

Change ignore status

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Qnet tool window – control point editing

Zooming Measure Views

The left and right measure views can be zoomed using the zoom buttons above each view.

Note: If the Geom button is selected, the right zoom buttons are inactive since the right measure will be scaled to match the left measure.

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Qnet tool window – control point editing
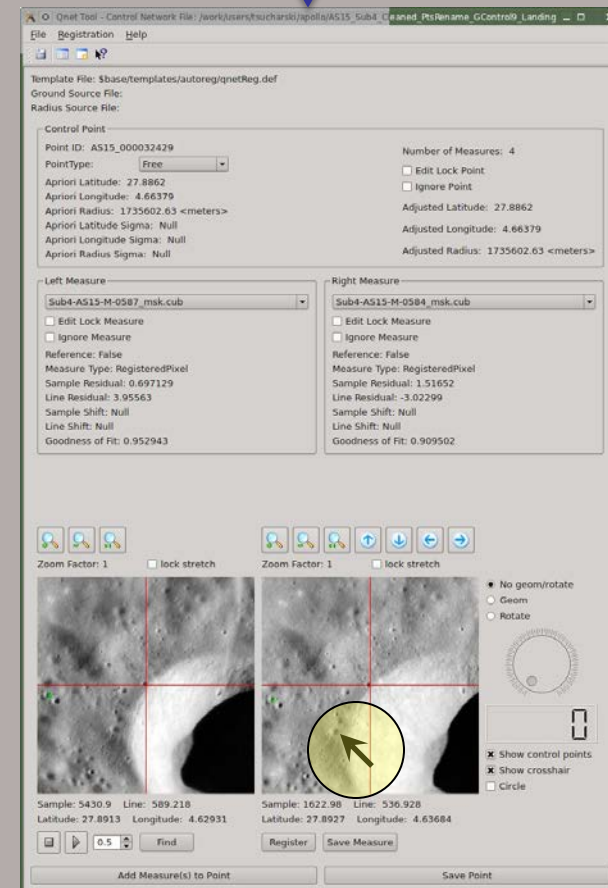
Changing Measure Locations (right view only)
The measure location can be adjusted by:
• Move cursor location under the crosshair by clicking left mouse button
  in the right measure view.

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Qnet tool window – control point editing

Changing Measure Locations (right view only)
The measure location can be adjusted by:
- Move cursor location under the crosshair by clicking left mouse button
- Move 1 pixel at a time by using arrow keys on the keyboard
- Move 1 pixel at a time by using arrow buttons above the right view

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Qnet tool window – control point editing
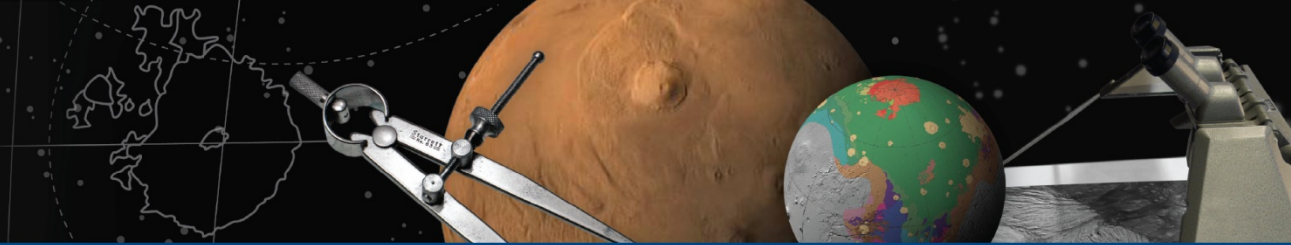
Below the left view:
- **Blink controls:** Blink left and right view in left view window using the
  "Blink Start" button (with play icon) and "Blink Stop" button (with stop icon).
  Both arrow keys above the right view and the keyboard arrow keys may be
  used to move the right view while blinking.
  Note: The left view is the reference measure and cannot be moved.

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Qnet tool window – control point editing

Below the left view:

- **Blink controls:** Blink left and right view in left view window using the "Blink Start" button (with play icon) and "Blink Stop" button (with stop icon). Both arrow keys above the right view and the keyboard arrow keys may be used to move the right view while blinking.
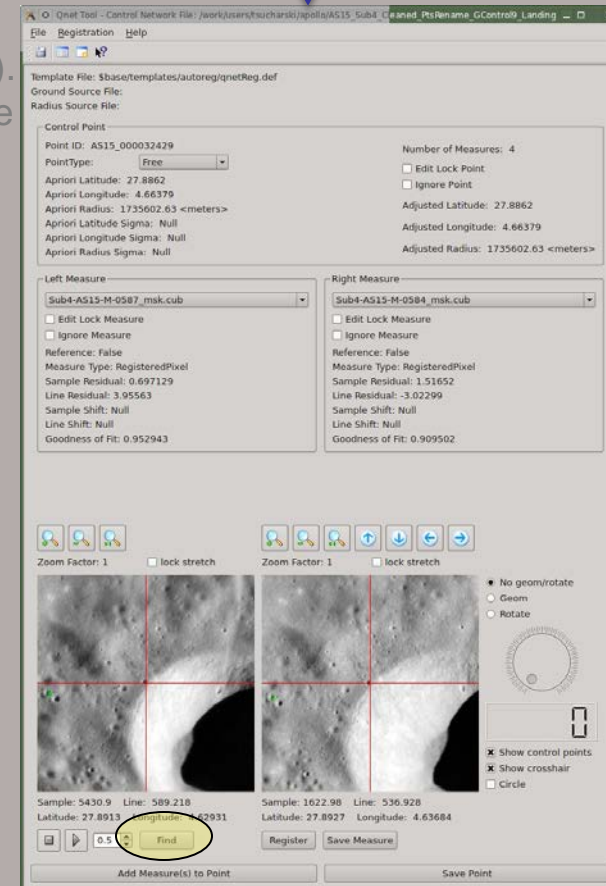 **Note:** The left view is the reference measure and cannot be moved.

- **Find:** Center right view so that the same latitude / longitude is under crosshair as the left view.

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Qnet tool window – control point editing

Below the right view:
• **Register:** Sub-pixel register the the right view to the left view.

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Qnet tool window – control point editing

Below the right view:
• **Register:** Sub-pixel register the the right view to the left view.
   If sub-pixel registration is successful, statistics are displayed.

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Qnet tool window – control point editing

Below the right view:
• **Register:** Sub-pixel register the the right view to the left view.
   If sub-pixel registration is successful, statistics are displayed.
   You can then choose to "Save Measure" or "Undo Registration".

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Qnet tool window – control point editing
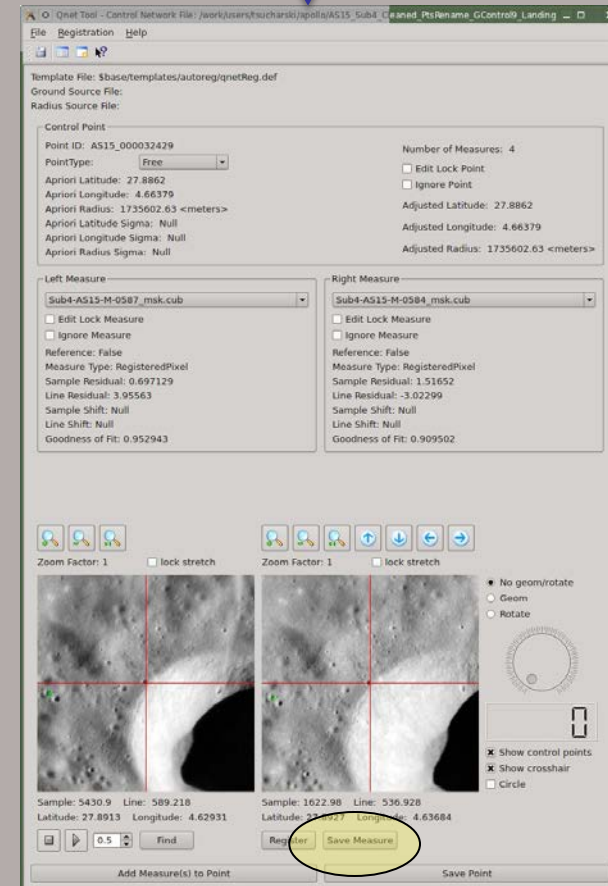
Below the right view:

• **Save Measure:** Save the control measure under the right view to the
edit control point.

Three core windows

Qnet tool window – control point editing

Along the bottom:
• **Add Measure(s) to Point:** Add control measure(s) to the current control
point. A dialog will show all cubes in the network with those that fall at this
control point's latitude and longitude highlighted. All cubes chosen will be
added as control measures to this control point.

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Qnet tool window – control point editing

Along the bottom:
- **Add Measure(s) to Point:** Add control measure(s) to the current control point. A dialog will show all cubes in the network with those that fall at this control point's latitude and longitude highlighted. All cubes chosen will be added as control measures to this control point.
- **Save Point:** Save the edit control point to the control network.

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Qnet tool window – control point editing

Other Point Editor Functions
Along the right border of the window:
- **Geom:** Geometrically match right view to the left view

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Qnet tool window – control point editing

Other Point Editor Functions

Along the right border of the window:

• **Geom:** Geometrically match right view to the left view

• **Rotate:** Rotate right view using either the dial or entering degrees

Three core windows

Qnet tool window – control point editing

Other Point Editor Functions
Along the right border of the window:
• **Geom:** Geometrically match right view to the left view
• **Rotate:** Rotate right view using either the dial or entering degrees
• **Show control points:** Draw crosshairs at all control point locations visible within the view
• **Show crosshair:** Show a red crosshair across the entire view
• **Circle:** Draw circle which may help center measure on a crater

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Control Network Navigator Window - Filtering

Cubes When this is selected, the user may click any of the following buttons:
• **"View Cube(s)"** to open all selected cubes
• **"Filter"** to list all cubes from the currently displayed list that meet the new filtering criteria selected.
   Note If the currently displayed list is already filtered, the new list will only display cubes that meet the criteria of all filters previously chosen until the user resets the list by selecting "Show All".
• **"Show All"** to reset the list to all images in the network

There are 3 filters for the cubes list which display the following:
• **Cube Name:** cubes whose file name contains the user specified string
• **Number of Points:** cubes containing (at least or no more than) the user specified number of points
• **Distance:** cubes that contain at least one pair of points that are within the user specified distance from each other

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Control Network Navigator Window - Filtering

Points When "points" is selected, the user may click any of the following buttons:

- **"View Cube(s)"** to open all cubes containing the selected point(s)
- **"Modify Point"** (or **double click** list item) to edit the point using the Qnet Tool
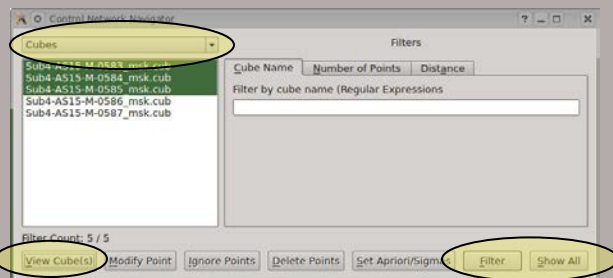- **"Ignore Point(s)"** to set selected points to "Ignore"
- **"Delete Point(s)"** to remove selected points from the control network
- **"Filter"** to list all points from the currently displayed list that meet the new filtering criteria selected.
    Note If the currently displayed list is already filtered, the new list will only display points that meet the
        criteria of all filters previously chosen until the user resets the list by selecting "Show All".
- **"Show All"** to reset the displayed list to all points in the network
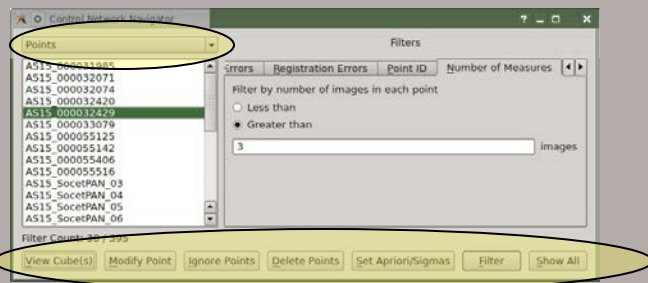
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Control Network Navigator Window - Filtering

There are 9 filters for the points list which display the following:
- **Jigsaw Errors:** points with bundle adjustment errors within the user specified range
- **Registration Errors:** points with sub-pixel registration errors within the user specified range
- **Point ID:** points whose Point Id contains the user specified string
- **Number of Measures:** points that are contained in (at least or no more than) the user specified number of images. The control point will contain at least the given number of **control measure**s.
- **Point Properties:** points that have the user specified property. There are 3 options and any combination may be chosen.
  - Filter by Point Type(s)
  - Filter by Ignore Status
    Note: If all of the measures in a point are ignored, then this point will be returned in the ignored point filter.
 - Filter by Edit Lock Status
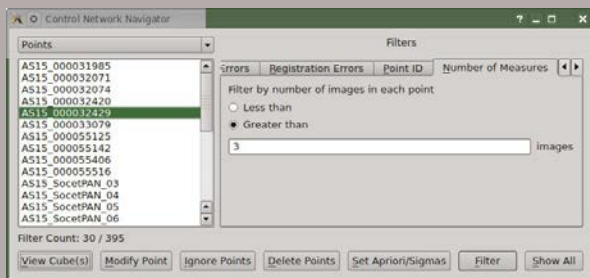
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Control Network Navigator Window - Filtering
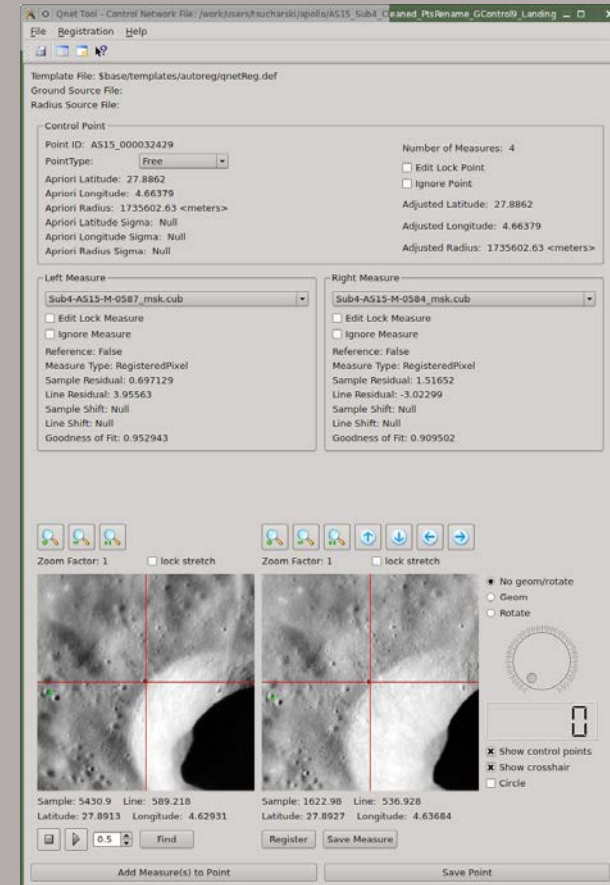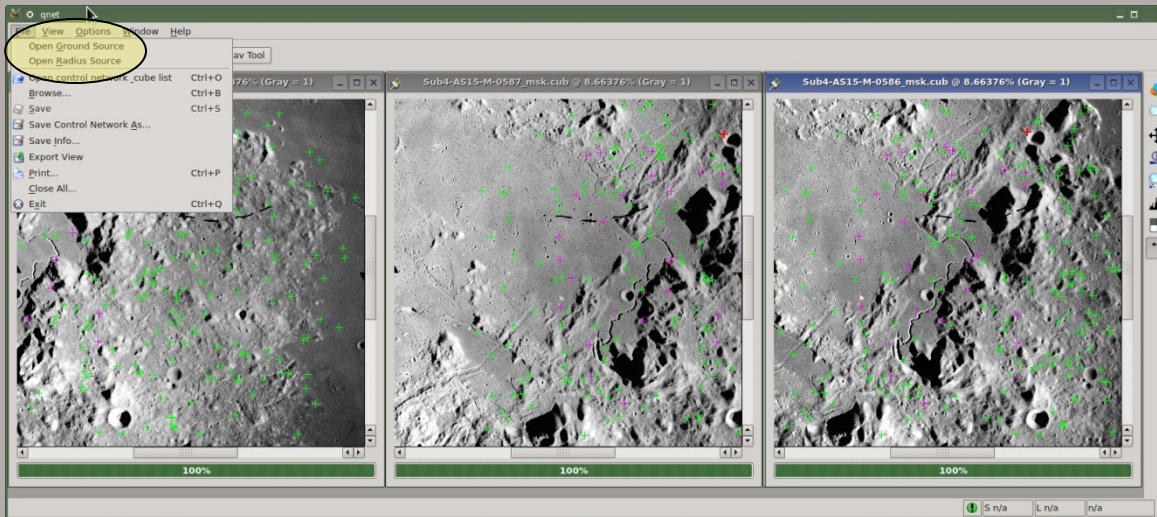
…Control Point filtering continued

• **Range:** points that lie within the user specified latitudinal and longitudinal ranges
• **Distance:** points that are within the user specified distance of some other point in the control network
• **Measure Properties:** points that contain at least one control measure that matches the selected criteria
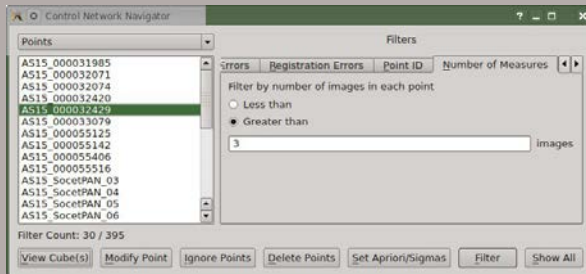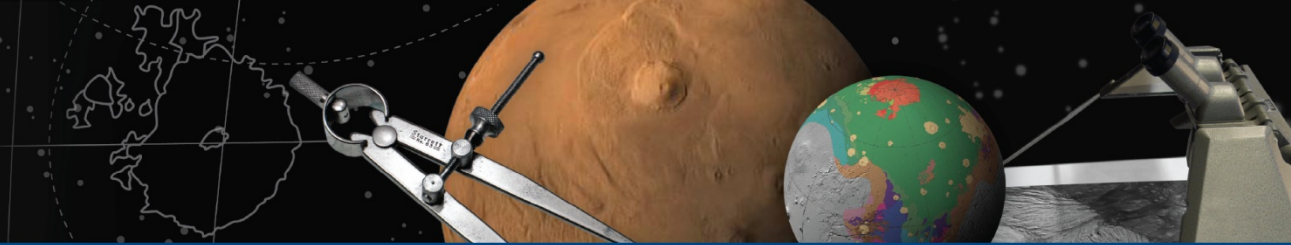
Tying to Ground
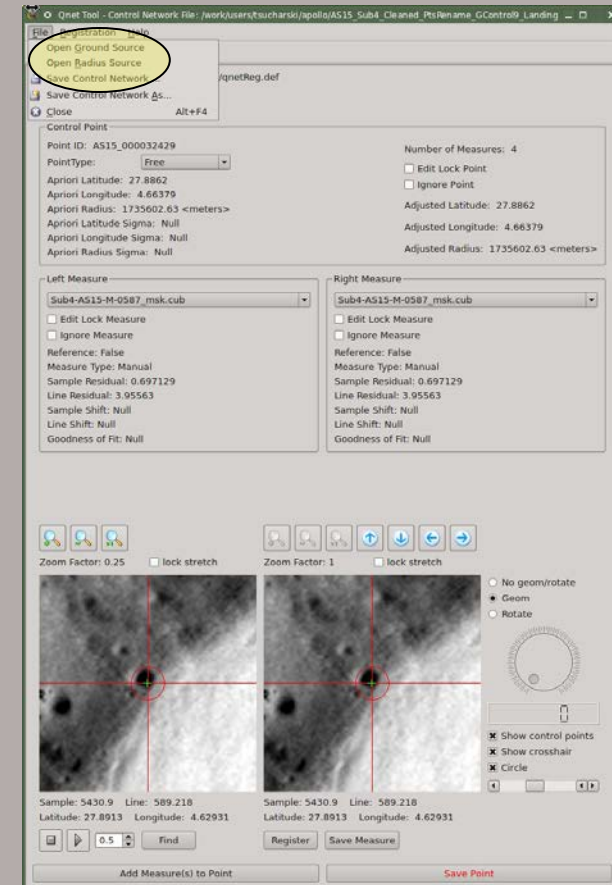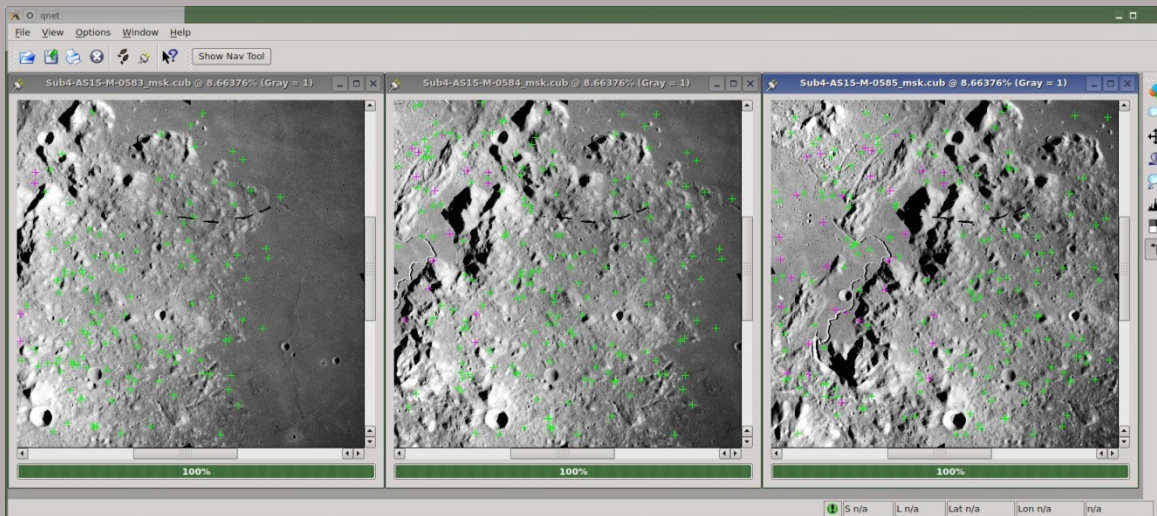
Two ways to open a ground source and a radius source:
- File menu of the Qnet main window

Tying to Ground

Two ways to open a ground source and a radius source:

- File menu of the Qnet main window

- File menu of the Qnet tool window

Tying to Ground

Reason for Ground Source vs Radius Source

• Easier to visually select points on a basemap or shaded relief of dem than a dem.
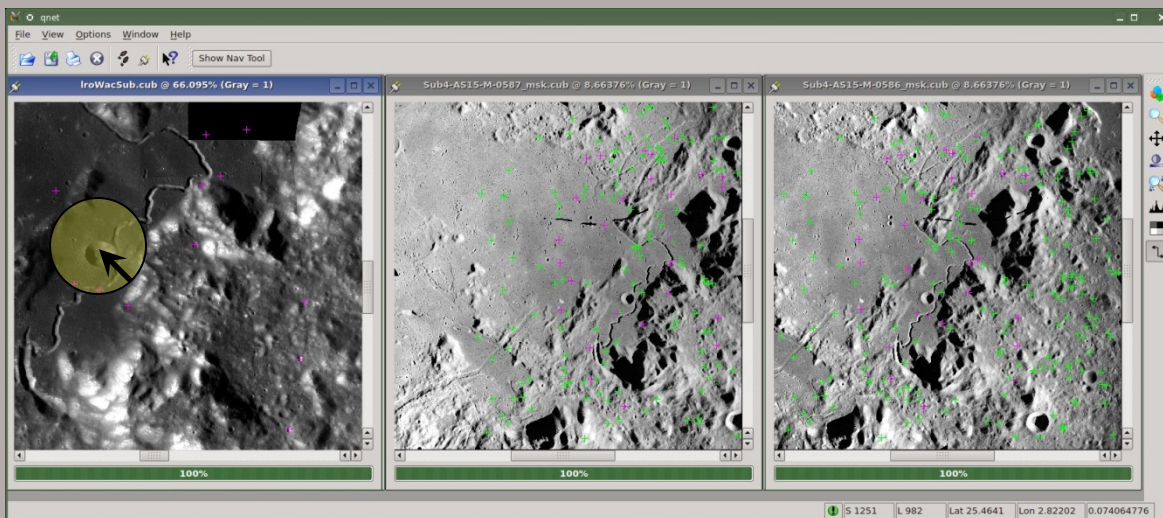• Want to use a dem that is not in the Isis data area.

Where does the radius come from if you do not enter a radius source?
From the reference measure. If the reference measure was *spiceinit* 'ed
with a shape model, the radius will come from the shape model, otherwise
it will default to the ellipsoid.

Tying to Ground
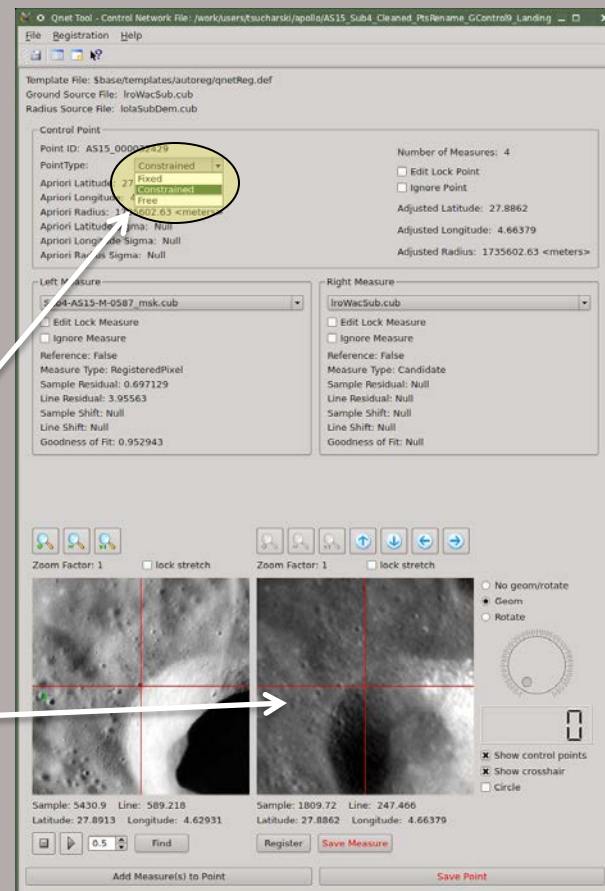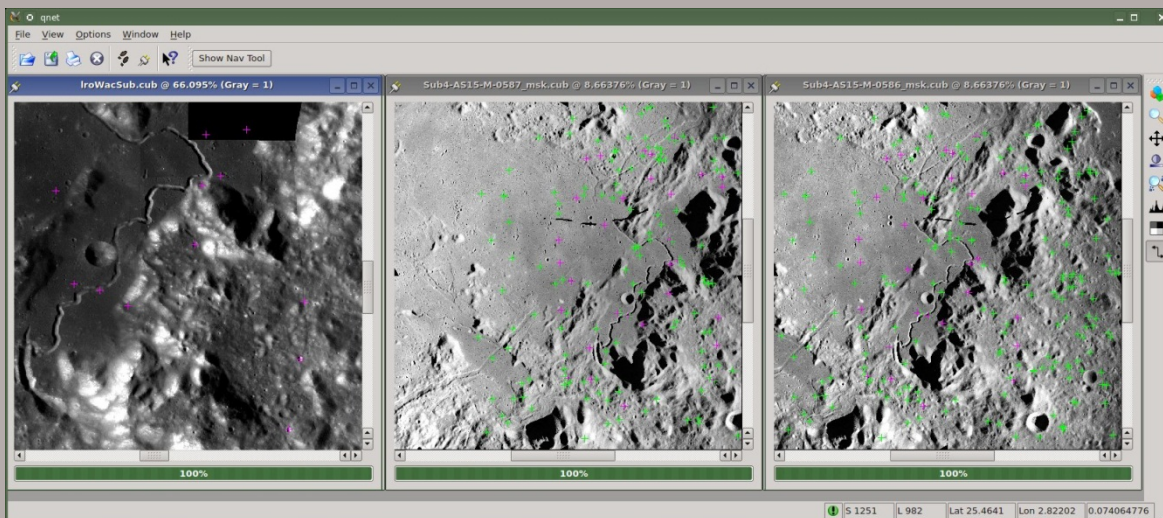
Methods for creating new ground point:
- Right click on ground source viewport
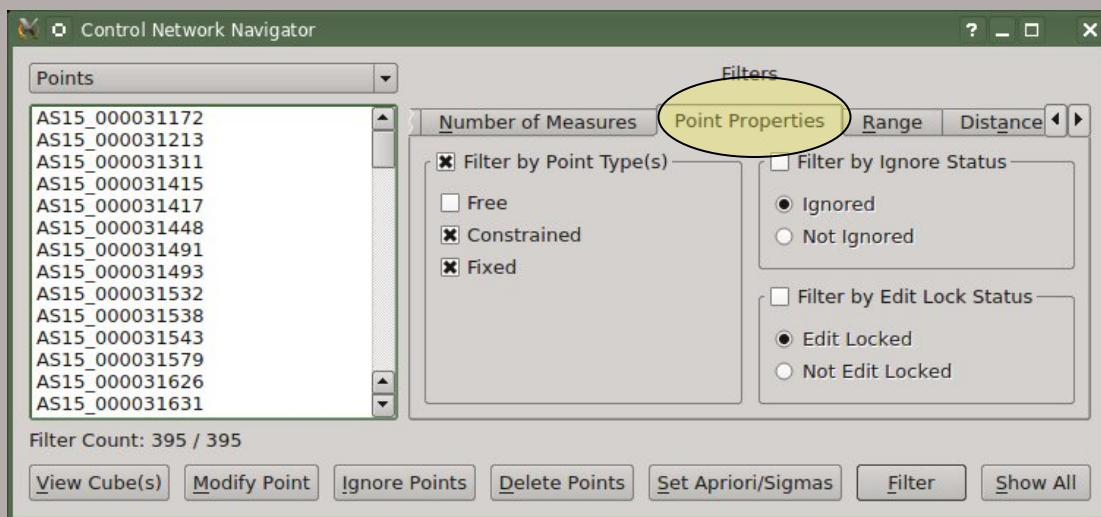
Tying to Ground

Methods for creating new ground point:
- Right click on ground source viewport
- Change current edit point to Fixed or Constrained
  - ground source loaded in right view

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Control Network Navigator Window – Set Apriori Sigmas

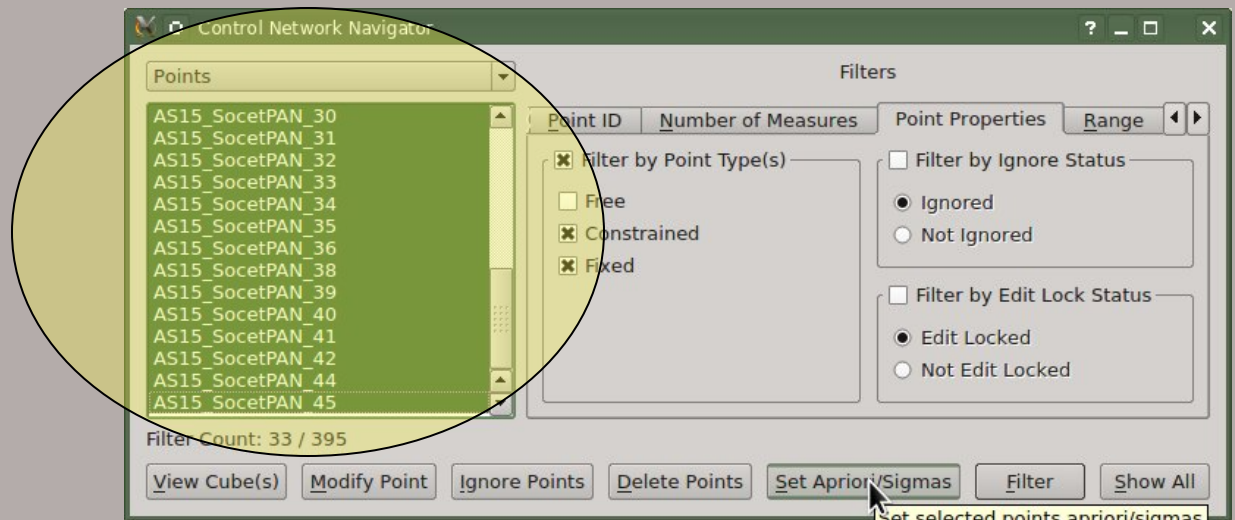1. Filter points using "Point Properties" tab, selecting "Constrained" and "Fixed"

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Control Network Navigator Window – Set Apriori Sigmas

1. Filter points using "Point Properties" tab
2. Select points you want to set sigmas on

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Control Network Navigator Window – Set Apriori Sigmas

1. Filter points using "Point Properties" tab
2. Select points you want to set sigmas on
3. Select "Set Apriori/Sigmas"

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Control Network Navigator Window – Set Apriori Sigmas

1. Filter points using "Point Properties" tab
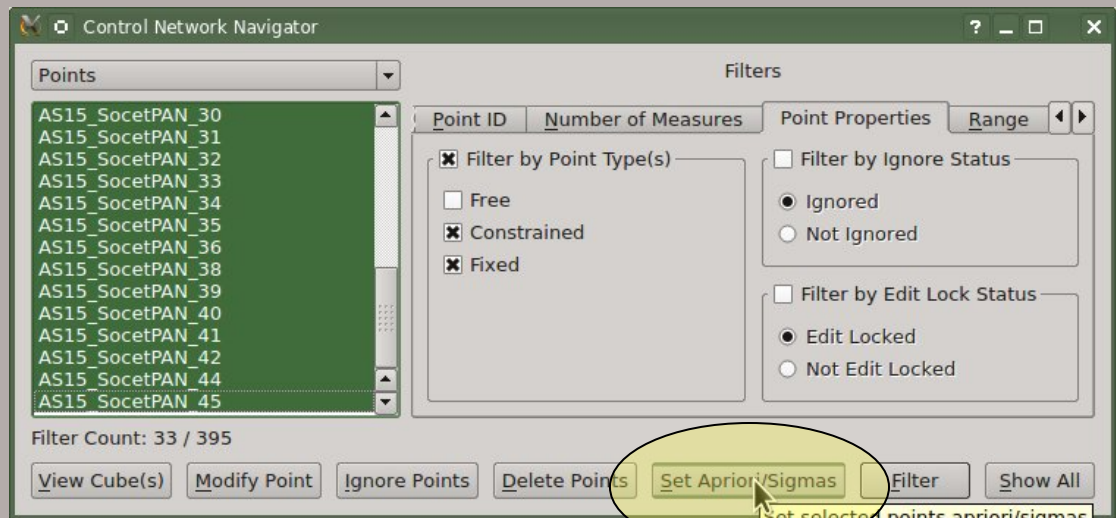2. Select points you want to set sigmas on
3. Select "Set Apriori/Sigmas"
4. Enter Latitude, Longitude and Radius sigmas