Sun Interference Calculator

Input Interface

Intelsat's online Sun Interference Calculator operates using one main window shown in Figure 1 below. The user may select to Batch Process Sun Interference Times by checking the box for this option. This option opens a screen (shown in Figure 2 below) which explains the next steps.

Alternatively, the user may select to Calculate Interference Times by Satellite, Analysis Type and Frequency Band. Based on the selections made, the options in the drop-down menu change or additional menu items become available.

The user may click on the Sun Interference Background hyperlink to open a document which provides some explanations on why sun interference occurs.

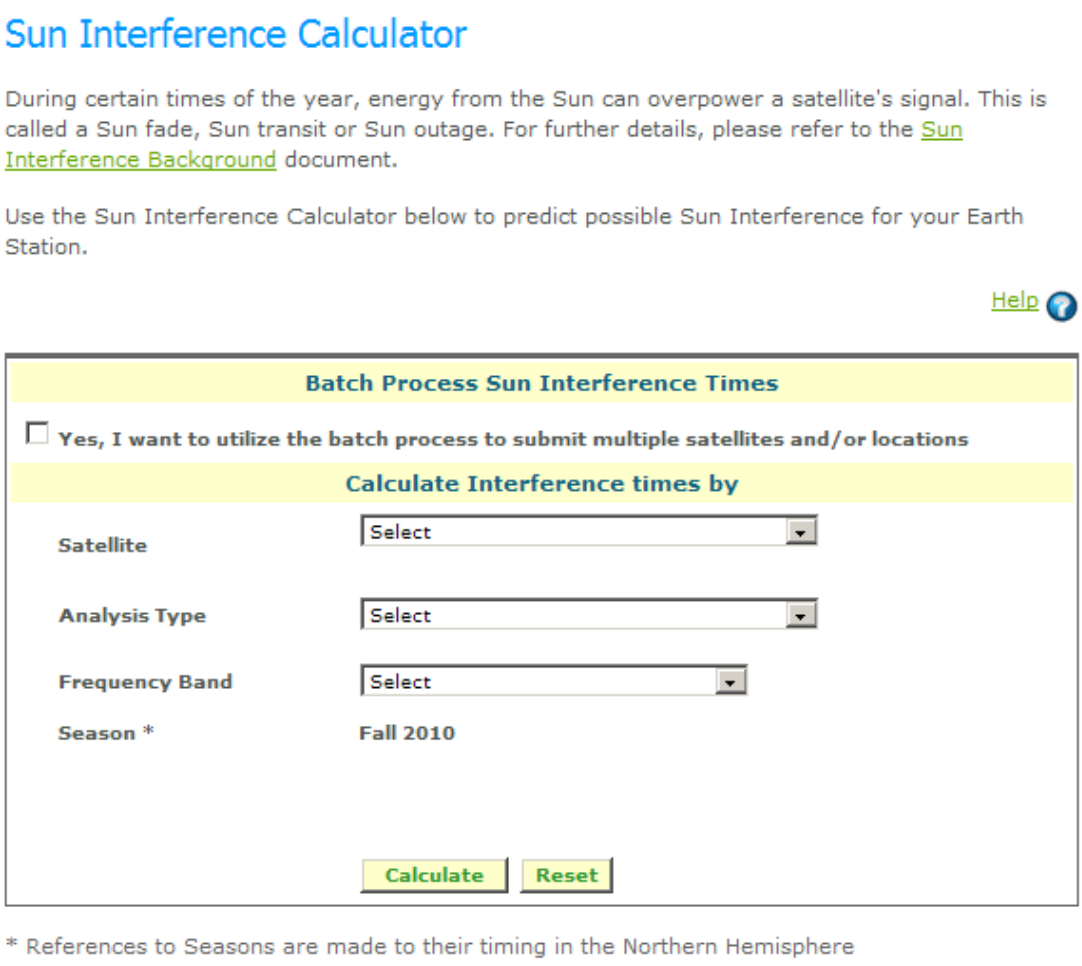


Figure 1. *The Sun Interference Calculator Main Window*

Batch Process:

This option is available through MyIntelsat and allows the user to specify a large number of satellites and/or E/S locations. Once the *Batch Process Sun Interference Times* box is checked, details on how to complete and upload a batch file are described on screen (see Figure 2), and a link to a sample *Batch Process Template* is provided.

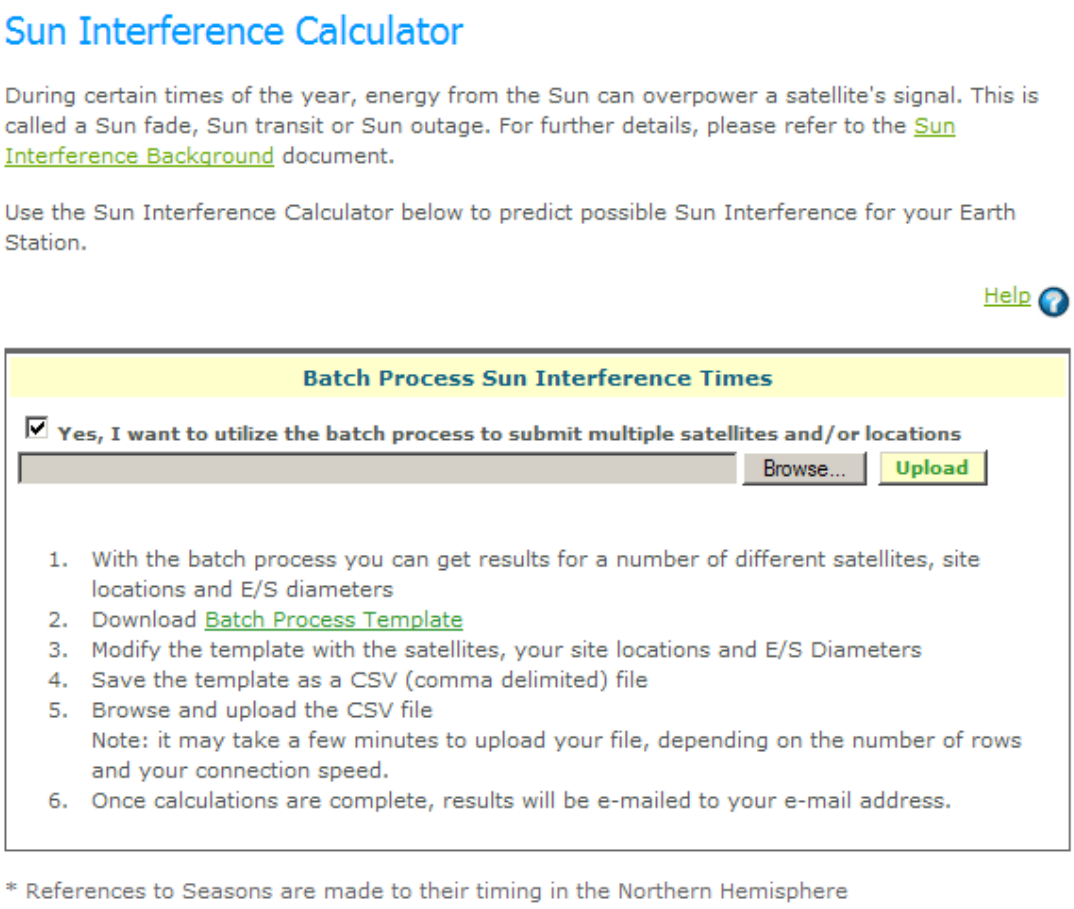
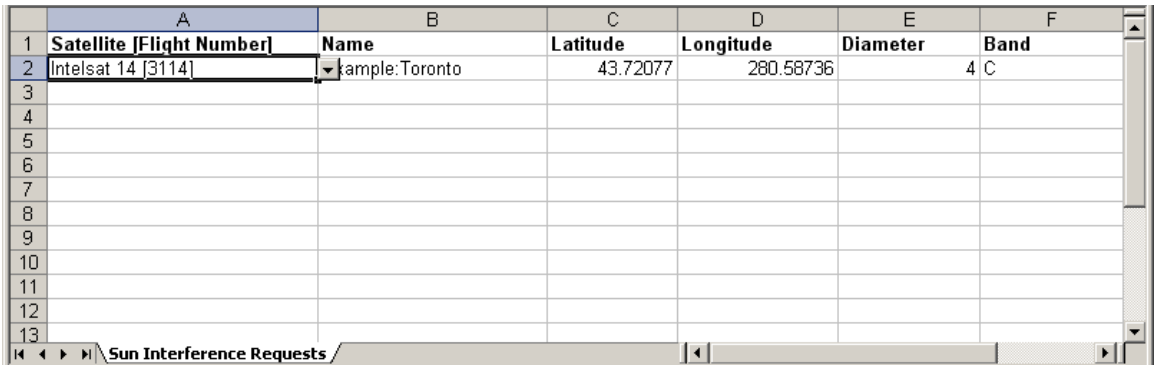


Figure 2. *The Batch Process Sun Interference Times selected*

The Batch Process Template (shown in Figure 3 below) is an Excel file with drop-down options for some cells ensuring data integrity. All fields are required in the template; if any field is missing for a data row, that computation will be skipped. An output message is displayed to the user indicating which rows of data were insufficiently completed to perform sun interference calculations.



	A	B	C	D	E	F
1	**Satellite [Flight Number]**	**Name**	**Latitude**	**Longitude**	**Diameter**	**Band**
2	Intelsat 14 [3114]	ample:Toronto	43.72077	280.58736	4	C
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						

Sun Interference Requests

Figure 3. *Example Batch Process Template file*

As described on screen, this capability requires inputs to be provided via a comma delimited (CSV) file. Therefore, after adding the desired entries into the batch process template, the file must be saved as a comma delimited file (CSV) as this is the only accepted file format. It is recommended to use the original Excel file format for entering new rows to be processed, as this input ensures data integrity.

Satellite:

The user may select from a preloaded list of Intelsat's satellites using a drop-down menu. Satellites are displayed in alphabetical order with their current sub-satellite point (orbital location) shown in brackets.

Analysis Type:

The user can select from three analysis types. The options vary based on the satellite selected: View All Registered E/S, Single E/S Mode, and Coverage Map with Sun Interference Times. The latter is currently under development and is available only for select satellites and seasons.

View all Registered E/S:

This option is available through MyIntelsat and calculates the sun interference for all earth stations currently registered by the logged-in customer on the selected satellite. Due to the large number of registered antennas for some customer/satellites, the user may have to wait before the results are displayed. During this time, the "Calculate" button will change to "In Progress" to remind the user not to make any further selections.

Single E/S Mode:

This option allows the user to further specify the earth station location by Code (if logged-in to MyIntelsat), by Country/City and E/S Diameter, or by Latitude/Longitude and E/S Diameter.

Search by an E/S Code:

This option is available through MyIntelsat and allows the user to select from all of the antennas registered by the logged-in customer to be pointing to this orbital slot. These antennas are displayed in a drop-down menu in alphabetical order based on the satellite selected and the customer account logged-in to MyIntelsat.

County/City and E/S Diameter:

This option allows the user to select a country and specific city to be used for the sun interference calculations.

Country:

The user can select from a number of countries that are covered by beams on the selected satellite (cut-off is the 0 degree elevation angle).

City:

The user can select from a number of cities in the selected country that are covered by beams on the selected satellite.

E/S Diameter:

The user can enter the E/S diameter in meters, feet, or inches. The radio buttons allow the user to select between the units.

E/S Latitude/Longitude and E/S Diameter:

This option allows the user to specify the site's Lat/Lon location to be used for the sun interference calculations.

E/S Latitude [deg]:

The user can enter the earth station's latitude. (+) indicates degrees North, (-) indicates degrees South.

E/S Longitude [deg]:

The user can enter the earth station's longitude. The tool accepts either positive or negative values when selecting the East (or West) radio button. Thus, the user may enter the location's longitude in 0 to 360 degrees East, or West.

Example: The following options will give correct results for Washington, DC: commonly used: 38.9N/77W, or 38.9N/283E, or less likely used: 38.9N/-77E, or 38.9N/-283W.

E/S Diameter:

The user can enter the E/S diameter in meters, feet, or inches. The radio buttons allow the user to select between the units.

Coverage Map with Sun Interference Times:

This option allows the user to display the sun interference times in a map view. This is in particular useful if a user has a large network and does not need exact times for each location. This feature is currently under development and is available for select satellites and seasons.

Frequency Band:

The user can select C-band or Ku-band. If the user initially selected to display results for All Registered E/S or for Single E/S Mode by E/S Code, this option will be grayed out, as the tool will use the earth station's registered frequency band.

Season

As indicated at the bottom of the online tool, the references to seasons are made to their timing in the Northern Hemisphere.
Note: For receive locations in the northern hemisphere (including locations on the equator), the spring season covers February to April, while the fall season covers August to October. For most accuracy, only the current season is being displayed. As results are based on current ephemeris data, results will vary depending on when the calculations are being performed.

Output Reports

The Sun Interference Calculator has three main output formats based on the selections made in the input interface.

Output Format 1:

In case of the Batch Process Sun Interference Times, the output page identifies each row that is being processed as shown in Figure 4 below. As indicated on screen, an email will be sent to the currently logged-in user once the calculations are completed.

INTELSAT

Sun Interference Batch Submission

Thank you for your submission. The following 12 items have been submitted for processing.

The uploaded file is currently processing. You will receive the results at "your email address" when complete.

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Satellite Name	Name	Latitude	Longitude	Diameter	Band
Intelsat 1002	WDC	38	283	1.2	KU
Intelsat 902	London	0	0	2.4	C
Galaxy 13/Horizons 1	Toronto	46.72077	280.58736	1.2	KU
Galaxy 14	NYC	40	-74	1.8	KU
Galaxy 16	WDC	38	283	1.2	C
Galaxy 27	Atlanta	33.8	-84.4	1.2	KU
Intelsat 1R	Sao Paolo	-23	-46.4	3.6	C
Galaxy 11	Tunis	37	10	1.2	KU
Intelsat 2	Sydney	-33.8	151.2	4.5	C
Intelsat 701	Tokyo	35.7	139.9	1.8	C
Intelsat 10	Mumbai	19.3	42.8	1.2	C
Intelsat 801	Frankfurt	50	8.4	1.5	C

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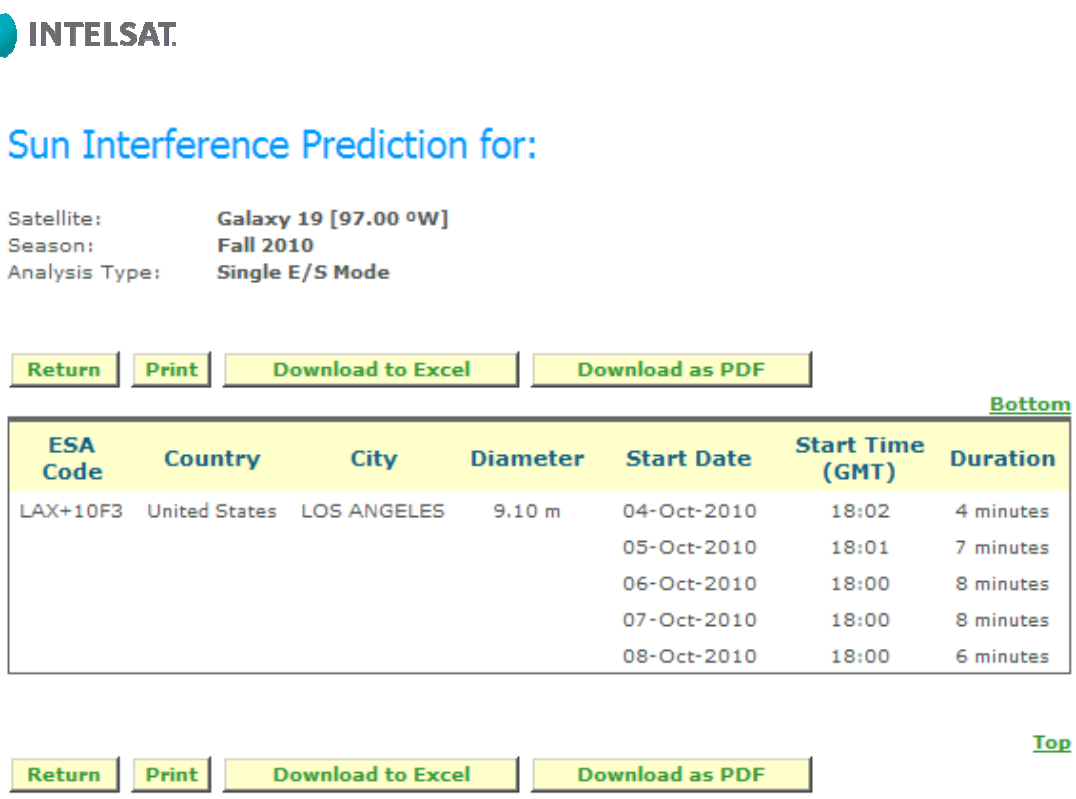
Figure 4. *Example Batch Process Output Message*

Output Format 2:

In case of the View All Registered Earth Stations or Single E/S Mode, the output shows a header specifying the selections made in the input interface followed by the detailed interference predictions in tabular format. Figure 5 below shows a sample output report. Below the input parameters, the user can find the *Return, Print, Download to Excel* and *Download as PDF* buttons on the left-hand side as well as the *Bottom* hyperlink on the far right-hand side. The buttons are repeated below the detailed report; the *Top* hyperlink below the detailed report allows the user to go back to the beginning of the output report. The *Download to Excel* option allows the user to further process the results.



Sun Interference Prediction for:

Satellite: **Galaxy 19 [97.00 ºW]**
Season: **Fall 2010**
Analysis Type: **Single E/S Mode**

Return | Print | Download to Excel | Download as PDF

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ESA Code	Country	City	Diameter	Start Date	Start Time (GMT)	Duration
LAX+10F3	United States	LOS ANGELES	9.10 m	04-Oct-2010	18:02	4 minutes
				05-Oct-2010	18:01	7 minutes
				06-Oct-2010	18:00	8 minutes
				07-Oct-2010	18:00	8 minutes
				08-Oct-2010	18:00	6 minutes

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Return | Print | Download to Excel | Download as PDF

Figure 5. *The Sun Interference Calculator Output Report Window*

Output Format 3:

In case of the Coverage Map with Sun Interference Times, the output shows a header specifying the selections made in the input interface followed by the coverage map as shown in Figure 6 below. The user may click on the map to enlarge it, select *Return, Print* or *Download as PDF* buttons on the left-hand side as well as the *Bottom/Top* hyperlinks on the far right hand side.
The map shows red-colored sun interference date lines as well as blue-colored sun interference start time lines.

INTELSAT

Sun Interference Prediction for:

Satellite: **Galaxy 19 [97.00 ºW]**
Season: **2010**
Analysis Type: **Coverage Map with Sun Interference Times**

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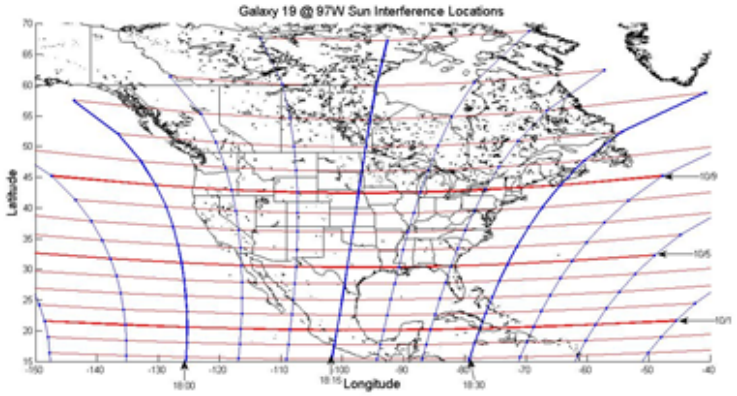

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Figure 6. *The Coverage Map with Sun Interference Times Output Window*