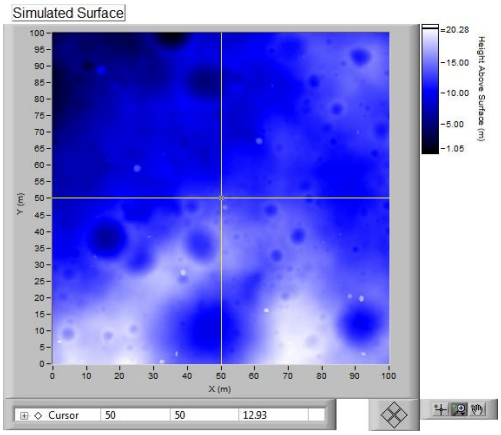
Flash LIDAR simulation tool

The flash LIDAR simulation tool was developed by ISI for the European Space Agency to model the performance of a LIDAR landing the surface of a solar system body. As well as being a radiometric model computing the return signal the package is capable of simulating the scanning of the LIDAR and the motion of a spacecraft as it approaches the surface of the target. The package simulates the complete throughput of the LIDAR operating with a Geiger Mode silicon Avalanche Photo Diode Detector. Easily adaptable the programme can be adjusted to simulate additional LIDAR measurements in a variety of environments.



The base level programme comes with a number of pre-loaded surfaces (Fig 1), that can be chosen by the user. A typical return from the model is given in (Fig 2). It shows the simulation of a LIDAR scanning across the surface of the target while the mounting spacecraft traverses across the scene.

More information of the simulation pacakge can be found in the attached introductory movie (link to movie) and user guide (link to user guide). For more information or the request a bespokje adpataion please contat ISI on mfoster@is-instruments.com

Fig 1 Pre loaded surface

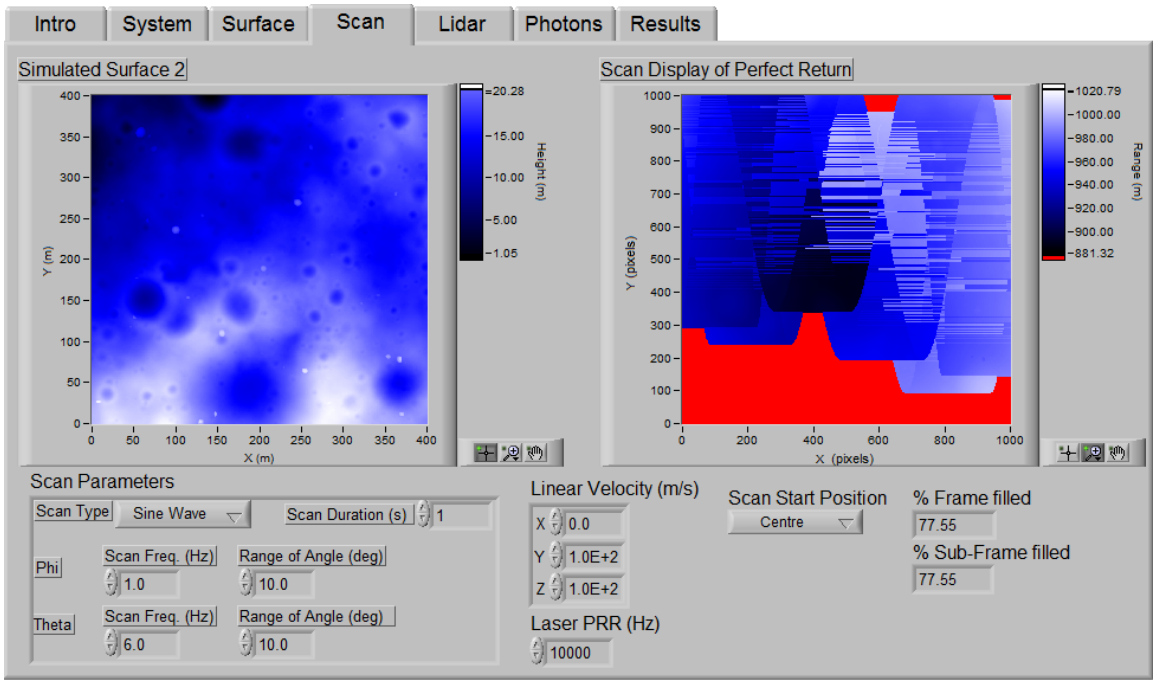


Fig 2 Example Return from the simulation tool

LIDAR simulation tool key features

- Computes radiometric performance of a LIDAR
- Can simulate both lissijous and Triangular scanning functions
- Computes area recovered within given period
- Include noise and background light effects
- Takes account of surface properties (albedo etc)
- Included LIDAR pointing angle
- Takes account of both detector and laser parameters
- Takes account of Geiger mode operation including computing range error as a function of signal to noise ratio
- Easily adaptable for additional features to be included