Ansys

# Ansys + PierSight

"For a startup like us who has one shot for success, no matter if the world believes in your theory and loves that you want to protect the oceans, it's still a challenge to get the capital even for a single shot. In order to ensure that you don't fail at this one shot, simulations come to your rescue. So, it's very important to simulate every single thing."

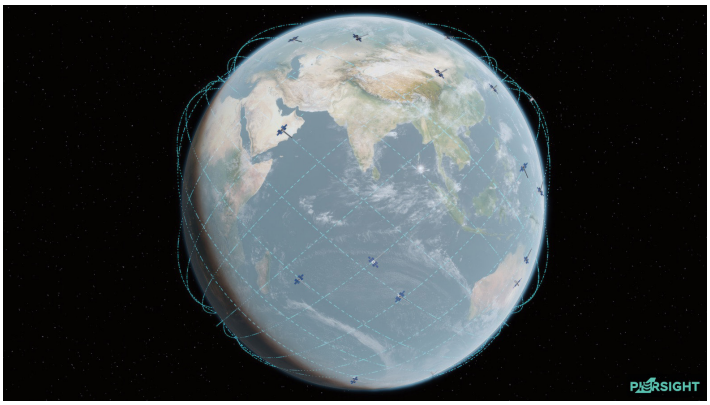
— **Gaurav Seth**
Co-founder and CEO / PierSight

CASE STUDY

# PierSight Designs SAR Technology for Persistent Ocean Monitoring With Ansys Software

Oceans cover about 71% of our planet's surface, which makes monitoring them incredibly difficult. However, this task is critical in aiding with rapid oil spill detection, exclusive economic zone (EEZ) monitoring, preventing illegal fishing, and more. PierSight aims to achieve the persistent monitoring needed to address these concerns in the maritime industry. To do so, the company uses synthetic aperture radar (SAR) and automatic identification system (AIS) satellites to revolutionize maritime surveillance.

*A render showing the PierSight automatic identification system (AIS) and synthetic aperture radar (SAR) satellite*



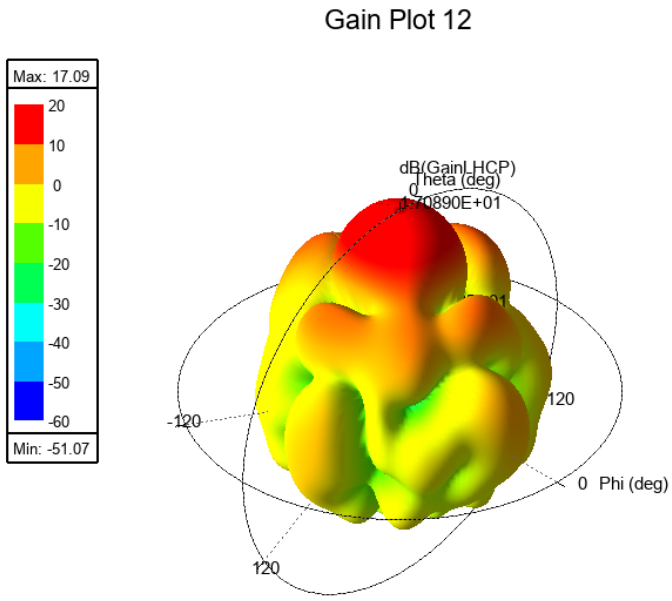

*A render showing the PierSight AIS and SAR satellite constellation*

## Challenges

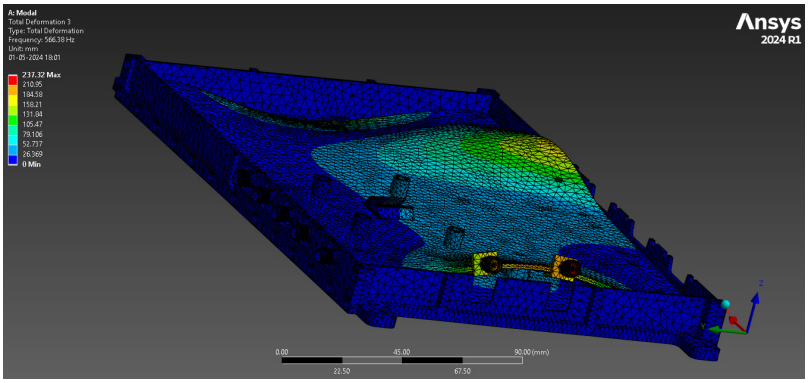
While PierSight's goals are clear, achieving them is no simple endeavor. First, space is a resource-intensive industry that typically involves lengthy design and development periods and large amounts of funding. Gaining the necessary funding with such a long lead time often proves difficult, especially for startup companies. Space is also a ruthless environment. "Even if only a single thing goes wrong, all your good intentions and hard work can be killed by space," says Seth.

## Technology Used

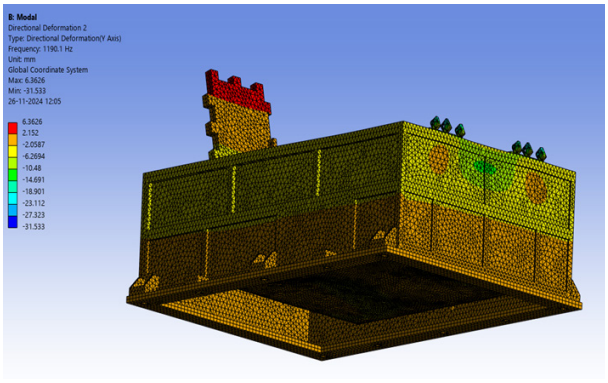
- Ansys Systems Tool Kit® (STK®) digital mission engineering software
- Ansys HFSS™ high-frequency electromagnetic simulation software
- Ansys Workbench™ simulation integration platform




*A gain plot showing the gain and radiation pattern of the antenna*




*Package-level modal analysis to understand the vibration characteristics of the electronic packages*




*Modal analysis matching in parallel axis (Y direction) to feed with tested frequency*

## / Engineering Solutions

PierSight used Ansys software throughout its design and development process:

- Using HFSS software and the Workbench platform, they designed the antennas used in their spacecraft, including the deployable antenna design that PierSight had already launched.
- The team was able to analyze the antenna performance through simulation before moving on to physical vibration tests.
- They utilized STK software to visualize and analyze the SAR satellite's thermal performance in space.

## / Benefits

- The accurate simulation results PierSight received from Ansys software helped the company "gain confidence before a difficult environmental test for space," says Seth.
- Participating in the Ansys Startup Program enabled PierSight to save costs by receiving simulation software at a discount.
- Simulation helped PierSight successfully launch its technology in the Varuna mission. To achieve this success, the PierSight team used Ansys simulation software to increase efficiency by upskilling their quickly growing team and reducing their development time. For the latter, the satellite PierSight used in the Varuna mission was built in only nine months — an 81.25% decrease in development time compared to the typical industry cycle for creating a SAR prototype.

## / Company Description

PierSight's mission is to transform the maritime industry and bring visibility to all human footprints at sea through the power of SAR and AIS satellite technology. Using this technology, PierSight aims to aid the maritime industry by providing all-weather imaging with low-latency data processing, seamless data fusion, and 100% ocean coverage at a fraction of current data costs.

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When visionary companies need to know how their world-changing ideas will perform, they close the gap between design and reality with Ansys simulation. For more than 50 years, Ansys software has enabled innovators across industries to push boundaries by using the predictive power of simulation. From sustainable transportation to advanced semiconductors, from satellite systems to life-saving medical devices, the next great leaps in human advancement will be powered by Ansys.

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