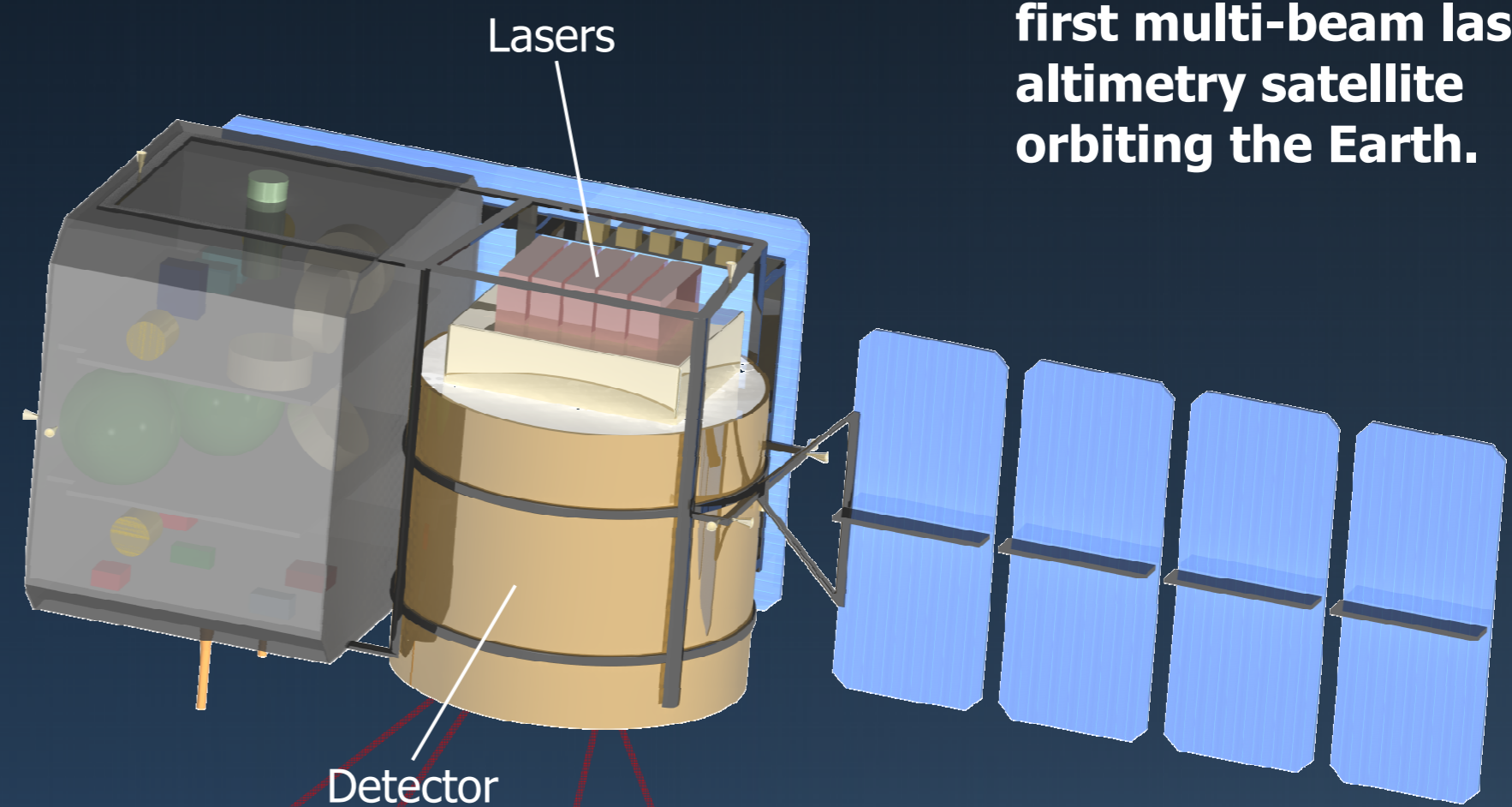


POLESat

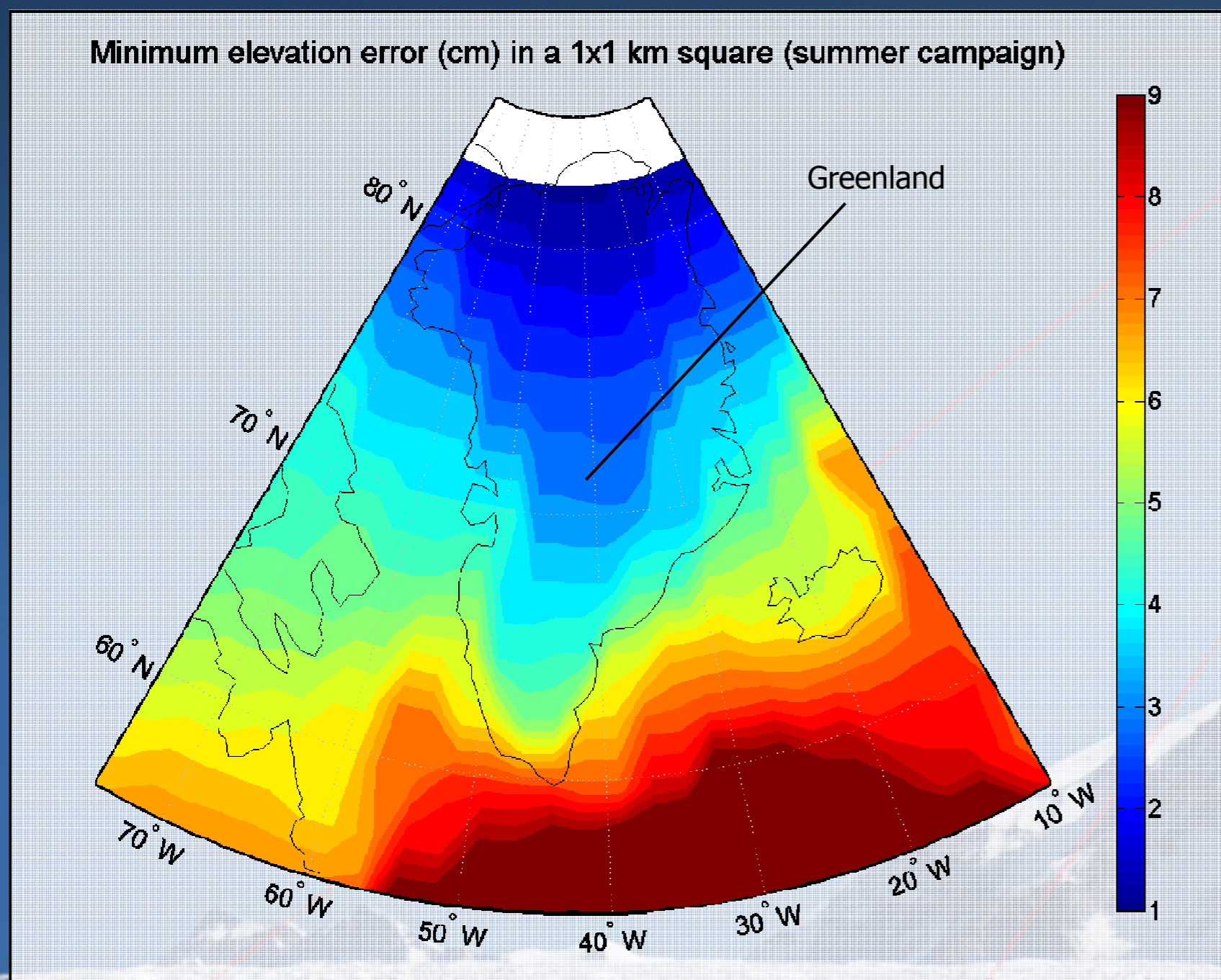
The Pole Oriented Laser Elevations Satellite

The primary objective of the Pole Oriented Laser Elevations Satellite (POLESat) mission is to enhance knowledge about the effects of climate change on the polar ice caps. For this purpose, POLESat will carry five operational lasers to take high accuracy elevation measurements, from which ice sheet mass balances can be derived. Other applications of data from POLESat include hydrological issues and biomass estimations of tropical rainforests.

POLESat will be the first multi-beam laser altimetry satellite orbiting the Earth.



POLESat carries 10 lasers: 5 operational and 5 spare, and has a detector with an effective lens diameter of 1.5 m.



Key figures of POLESat

Wet mass: 2000 kg
Size: 2 × 2 × 3.5 m
Power: 3 kW

Cost: €700 million
Launch date: mid-2012
Lifetime: 10 years

Currently, the elevation of the polar ice sheets is measured using a single operating laser onboard NASA's ICESat mission. Compared to this mission, POLESat provides 40x more measurements and improves accuracy over a factor 1.5. Part of this improvement is achieved by using multiple lasers. Footprints of two crossing tracks are shown in the figure to the right.

POLESat will fly around the Earth in a sun-synchronous dusk-dawn orbit, at 477 km altitude. This gives the satellite a repeat orbit of 91 days, implying four measurement campaigns a year. This makes it possible to detect seasonal variations in the ice sheet mass balance. The minimum elevation error for the summer campaign is shown in the figure above.

