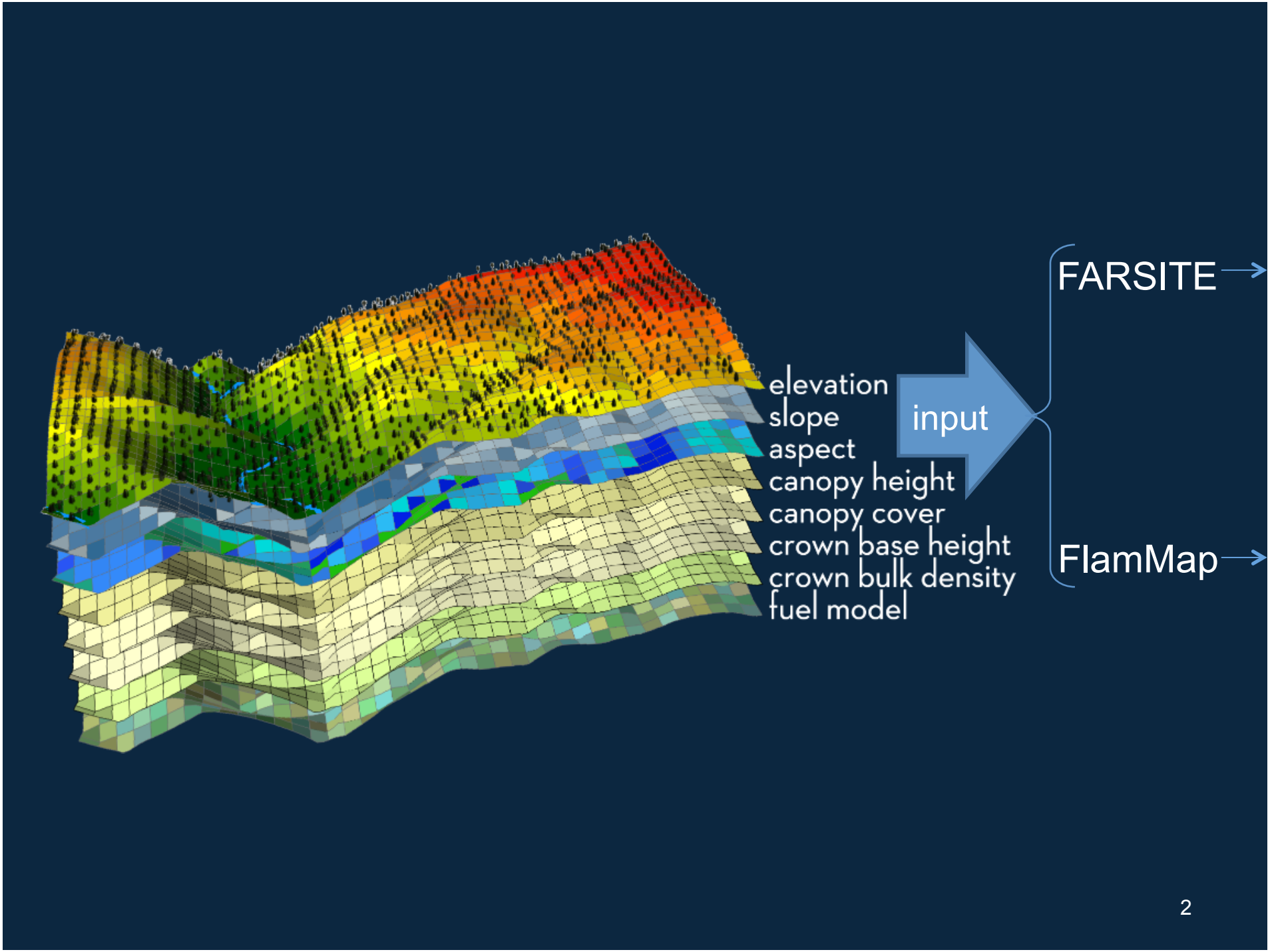
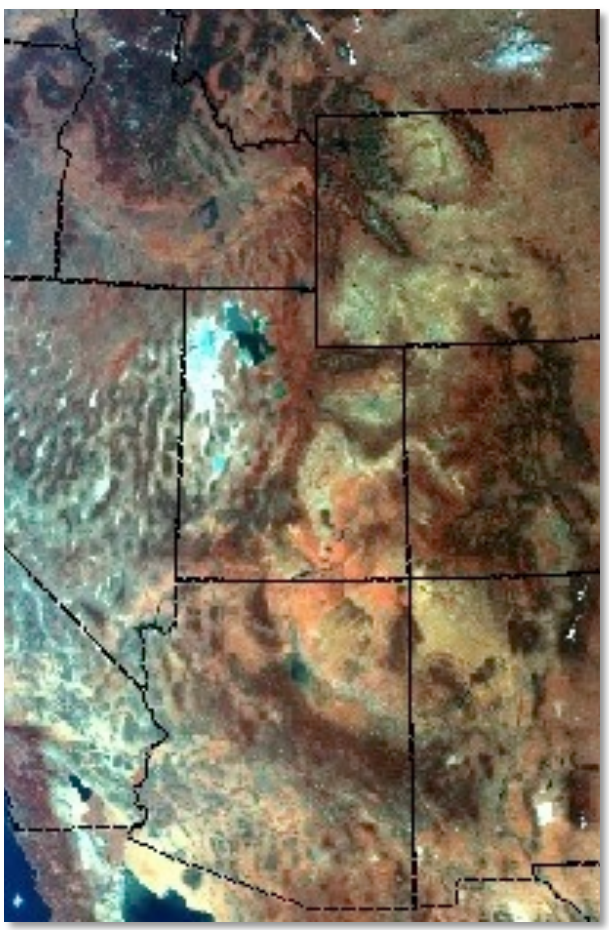

How can we model fire behavior in the forest?

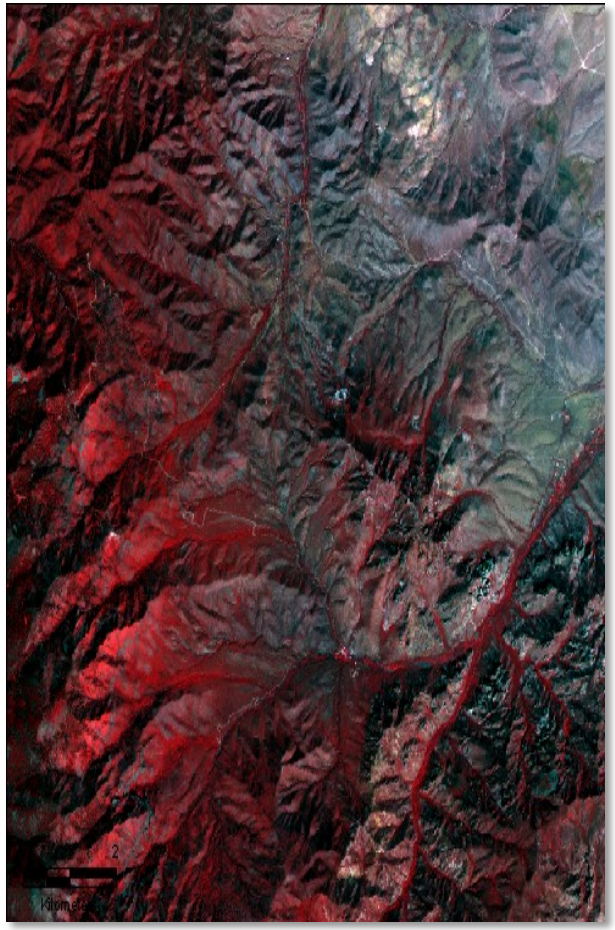

elevation
slope
aspect
canopy height
canopy cover
crown base height
crown bulk density
fuel model
input
FARSITE
FlamMap

Optical Remote Sensing: the View from Overhead



…MODIS

..1km



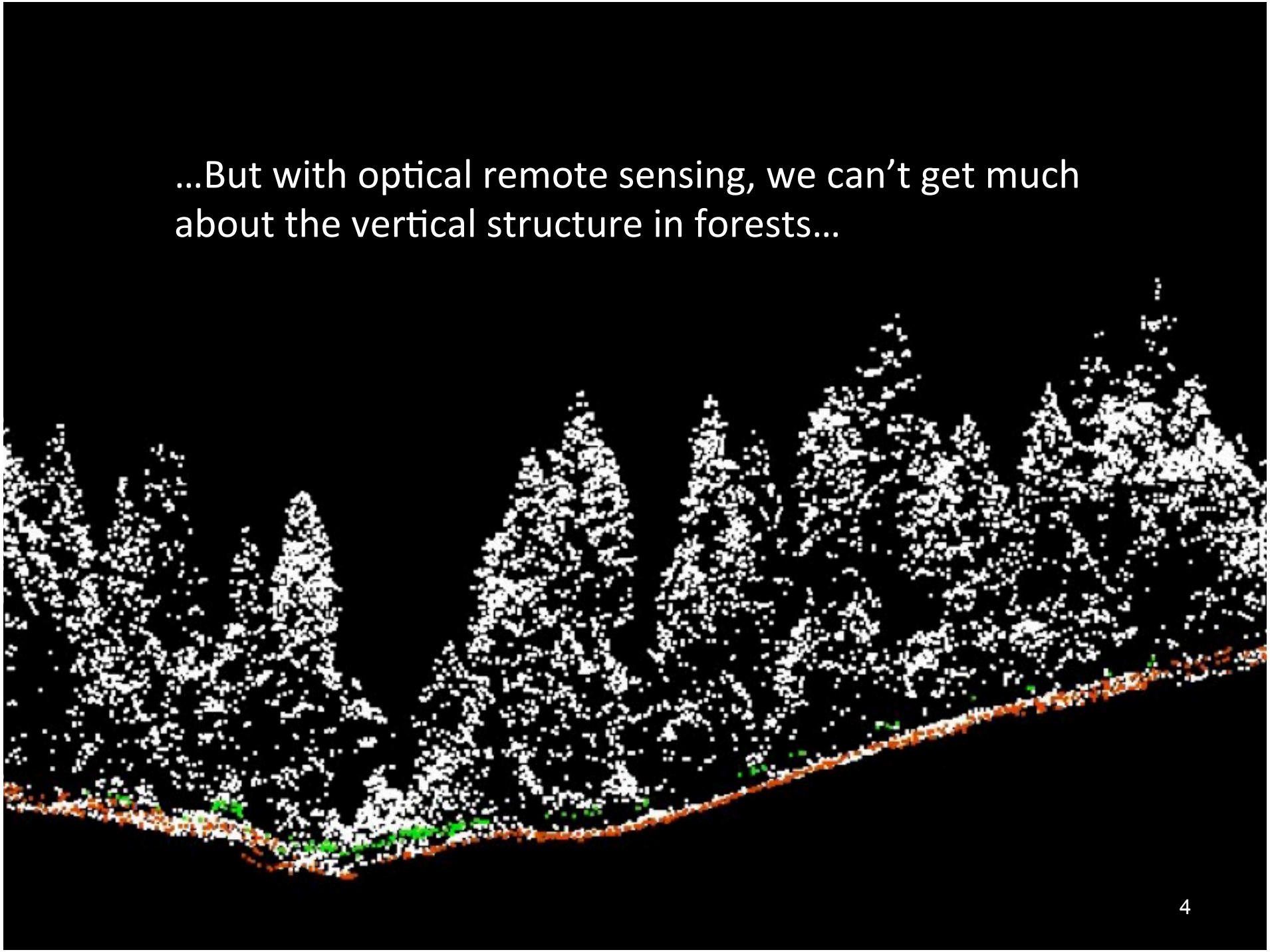
Landsat

30m

Orthophotography...

1m..

…But with optical remote sensing, we can't get much about the vertical structure in forests…



LiDAR = Light Detection And Ranging

how does it work?

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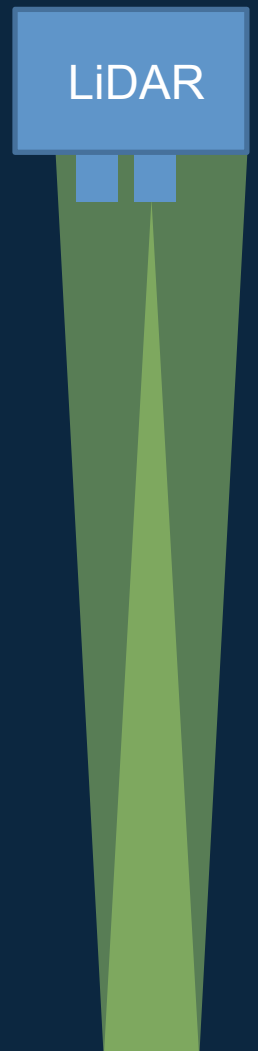


amplitude of detected signal

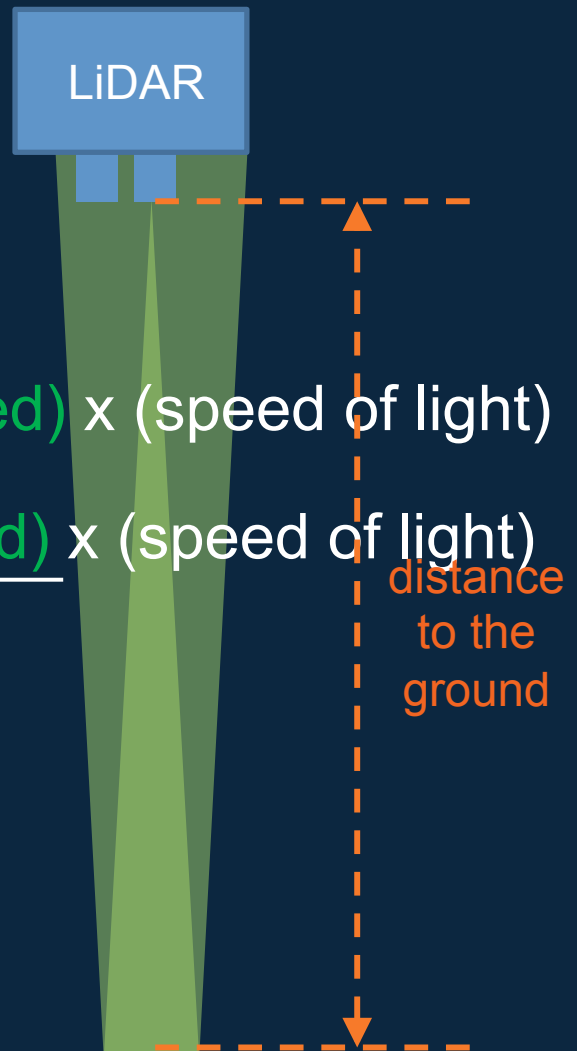
t

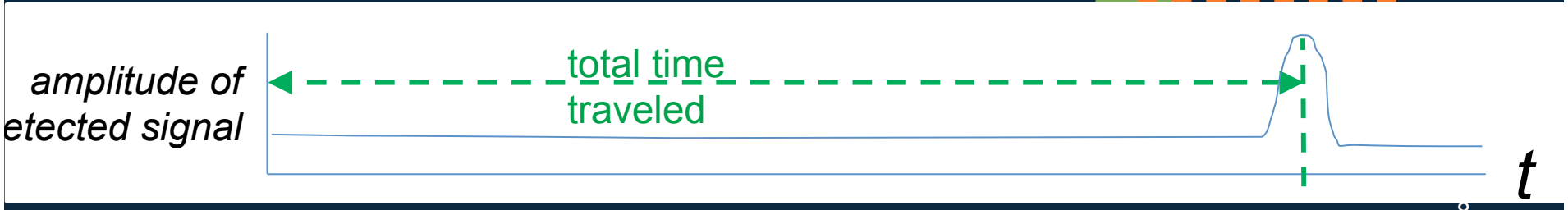
how does it work?

distance = time x speed

total *distance* traveled = (total *time* traveled) x (speed of light)

$$\text{distance to the ground} = \frac{\text{(total } \textit{time} \text{ traveled)}}{2} \times \text{(speed of light)}$$



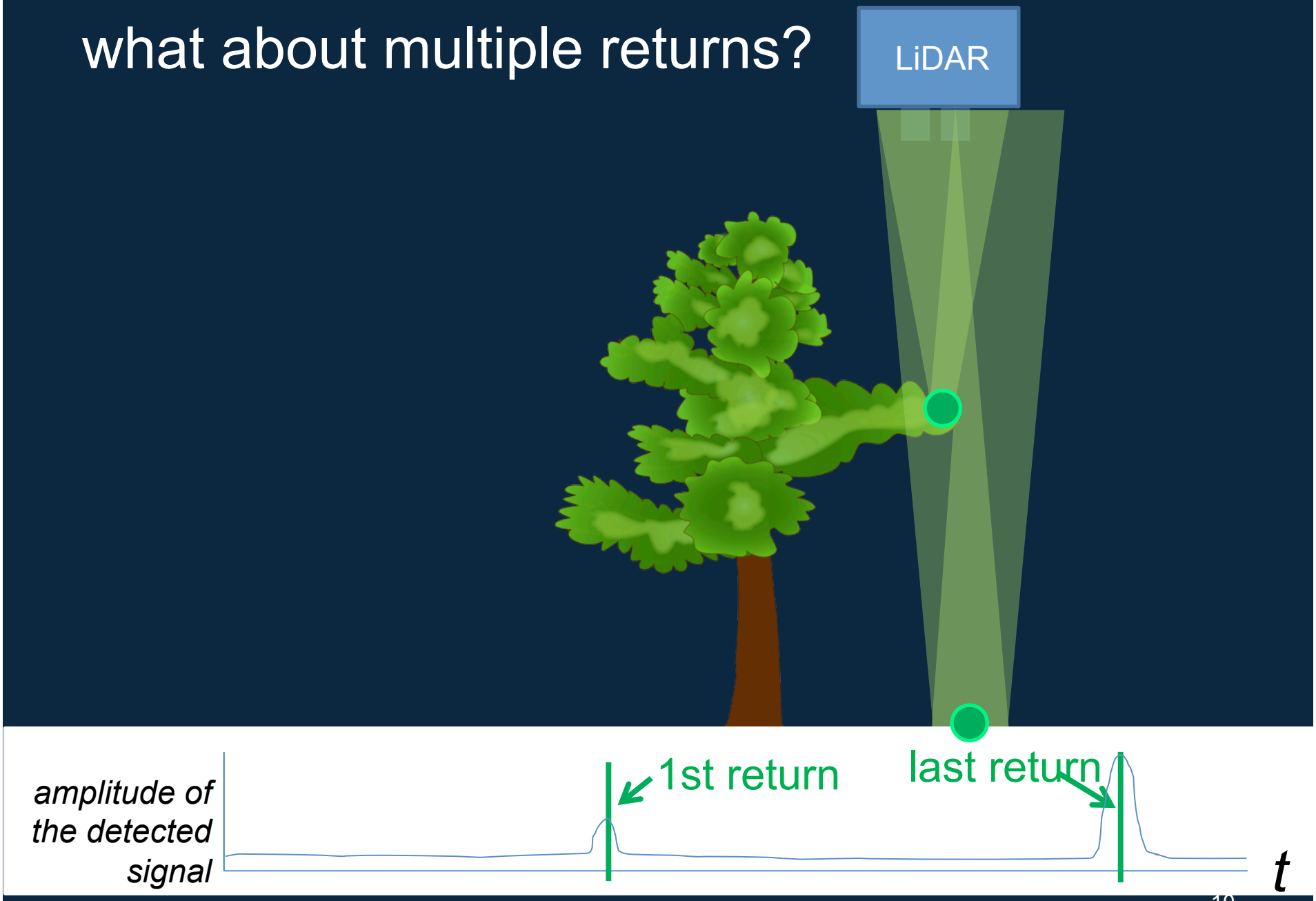


what about multiple returns?

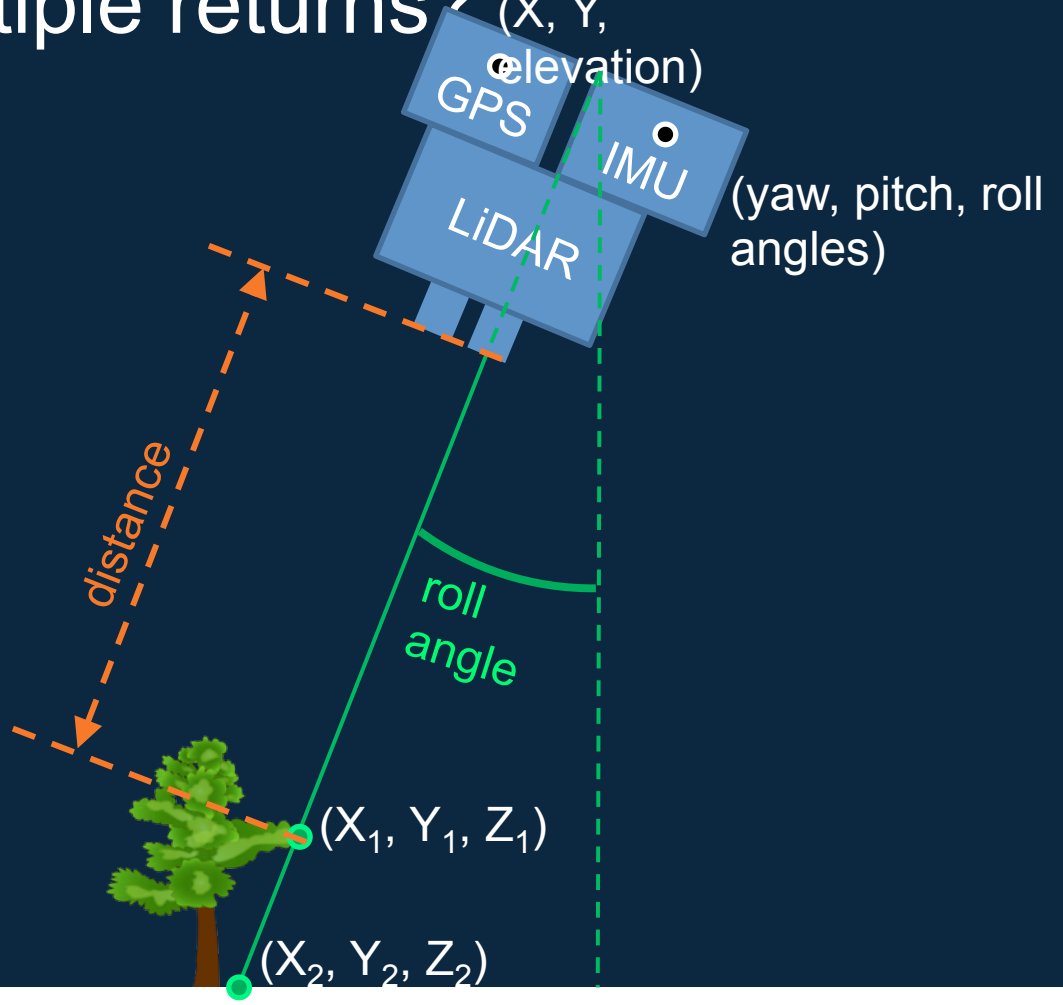
amplitude of etected signal

t

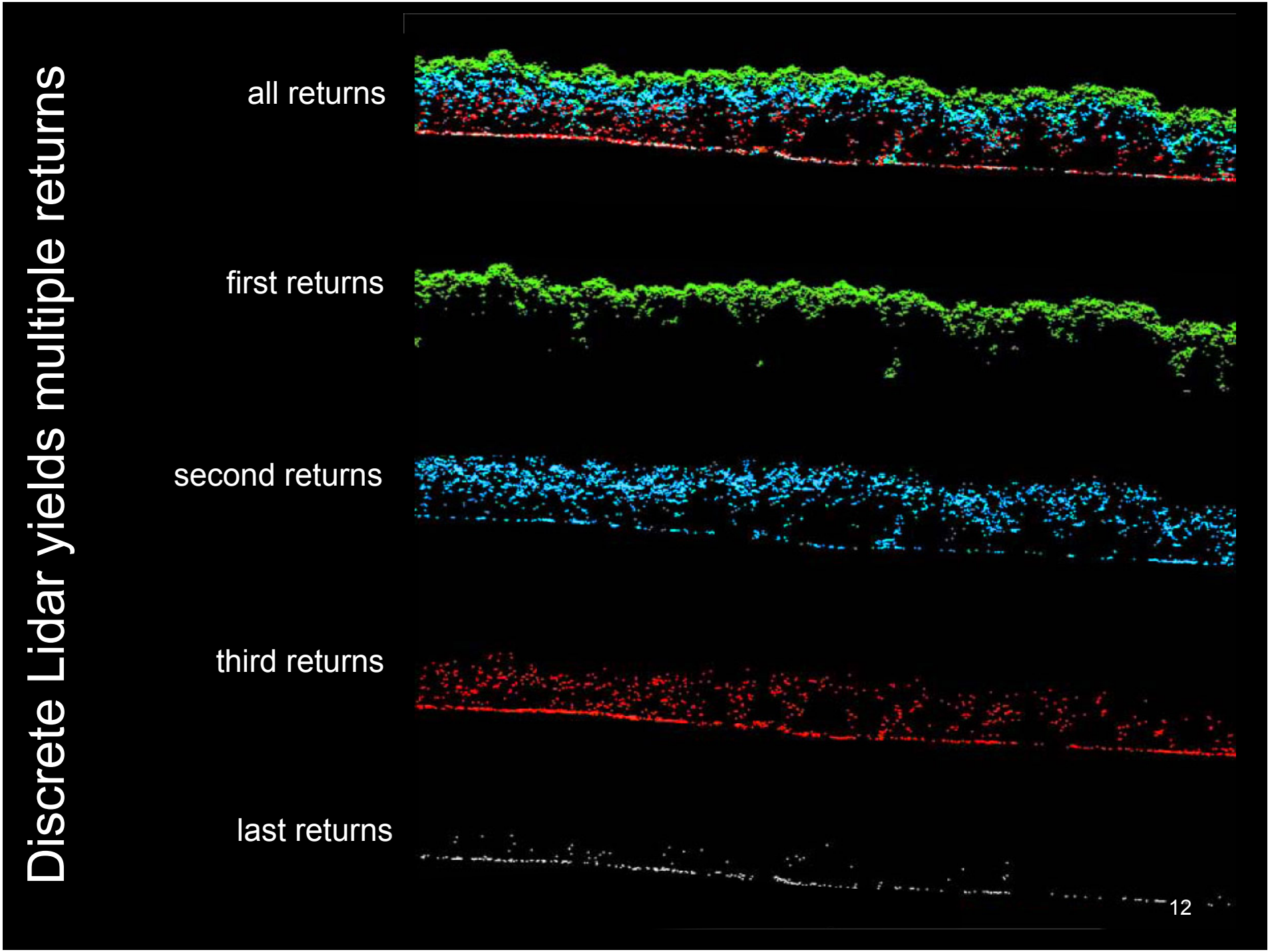
what about multiple returns?



what about multiple returns?



Discrete Lidar yields multiple returns



Lidar Data Products

Individual Trees

- Isolated from the point cloud, containing location, height, diameter

CHM – Canopy Height Model

- Height information about vegetation *features with elevation removed*

DSM – Digital Surface Model

- Elevation information about *all features* in the landscape, including vegetation, buildings and other structures

DTM – Digital Terrain Model

- Elevation information about bare-earth surface *without the influence of vegetation or man-made features*