

Using unmanned aerial systems for the monitoring of Belgium forests:

discrimination of tree species based on
time series of airborne images

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Using unmanned
aerial systems for
the monitoring of
Belgium forests

Introduction

Measurement of
the vegetation
height

Discrimination of
tree species

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Introduction

Measurement of the vegetation height

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Alert: you are harvesting more than the productivity

— +

GROWTH:
9 m³/ha.an

Menu



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Measurement of the vegetation height

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- ▶ The **spatial resolution** : unmanned aircrafts fly at low-altitude, cover relatively small area but result in a very high resolution.
- ▶ The **temporal resolution** : UAS deployment is quick and operational costs are low. Revisit period can fit ecological phenomenons.



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the vegetation
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aerial systems for
the monitoring of
Belgium forests

Introduction

Measurement of
the vegetation
height

Discrimination of
tree species

Introduction

Measurement of the vegetation height

Discrimination of tree species

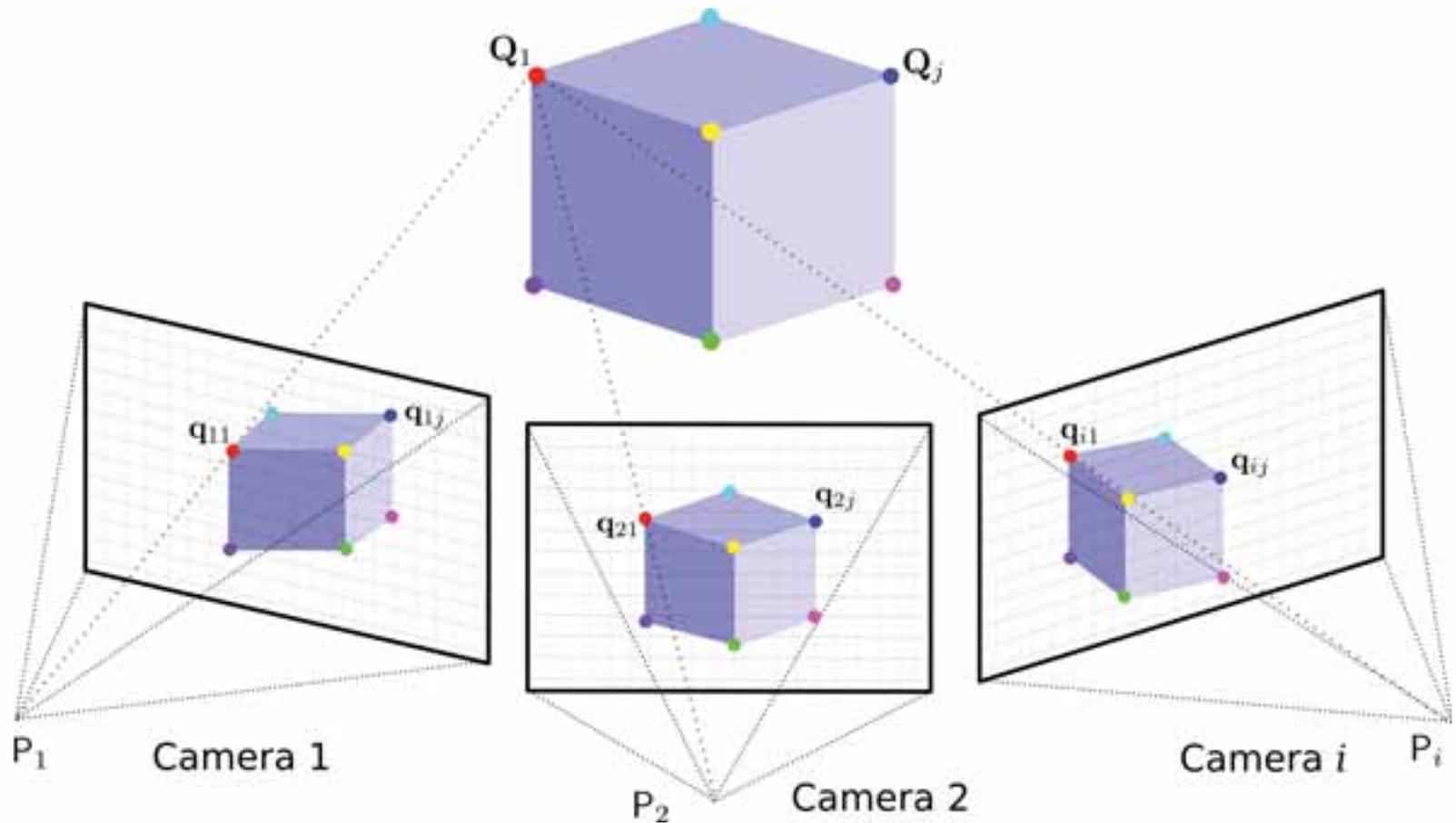


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aerial systems for
the monitoring of
Belgium forests

Introduction

Measurement of
the vegetation
height

Discrimination of
tree species



courtesy : Julien Michot

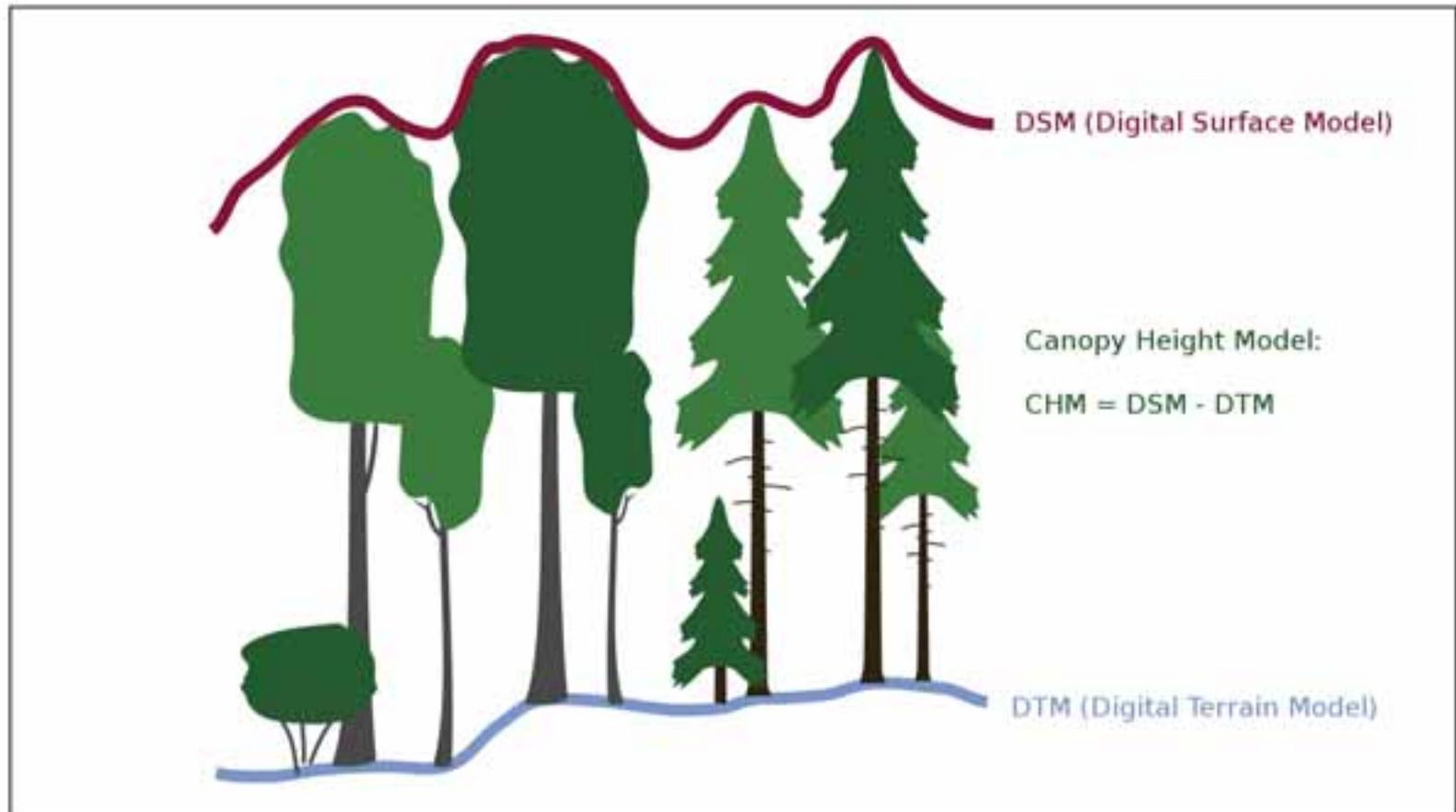


Using unmanned aerial systems for the monitoring of Belgium forests

Introduction

Measurement of the vegetation height

Discrimination of tree species



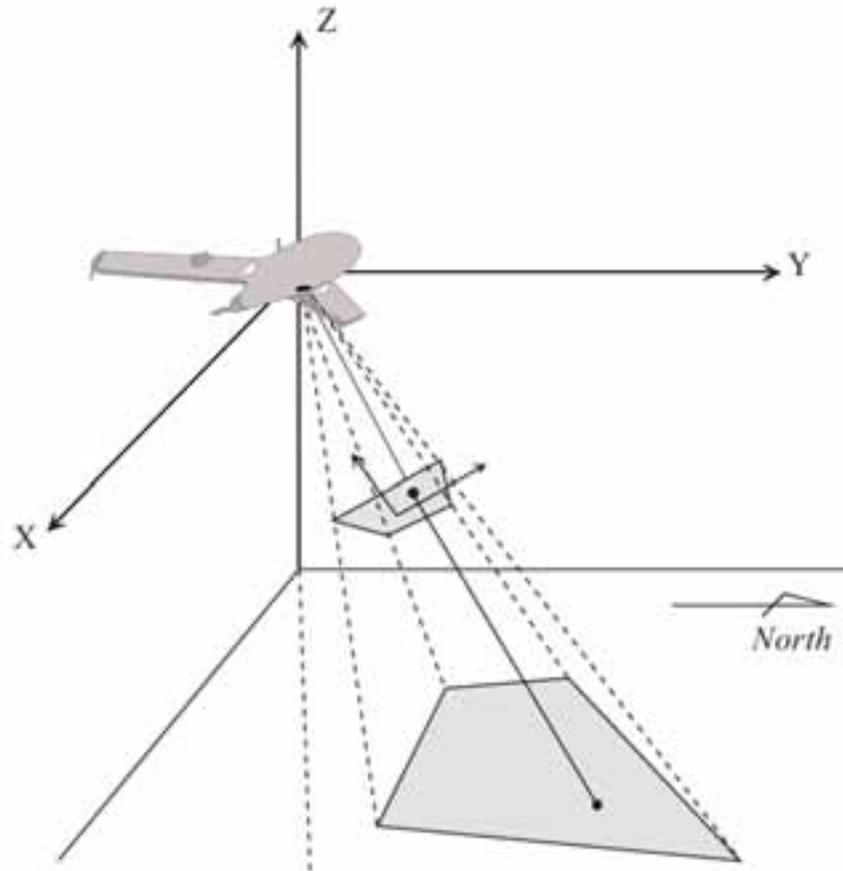
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Introduction

Measurement of the vegetation height

Discrimination of tree species

Low-oblique vantage images require true orthorectification in forested area.



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Introduction

Measurement of the vegetation height

Discrimination of tree species



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aerial systems for
the monitoring of
Belgium forests

Introduction

Measurement of
the vegetation
height

Discrimination of
tree species

Introduction

Measurement of the vegetation height

Discrimination of tree species



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Introduction

Measurement of the vegetation height

Discrimination of tree species

Goal : identifying species based on their phenology through the use of UAS imagery. Defining **which orthophotos are the more essential** for species discrimination (time windows, metrics).

- ▶ **24 flights** during 3 seasons (spring, summer and autumn)
- ▶ flight altitude from 150 to 350 meters
- ▶ from spring 2011 to autumn 2013
- ▶ a total of **12700 images**



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the monitoring of
Belgium forests

Introduction

Measurement of
the vegetation
height

Discrimination of
tree species

Pipeline :

1. Images acquisition
2. Processing Images block and co-registration
3. Delineate tree crowns (photo-interpretation) of known species (field inventory)
4. Compute metrics for each tree crown from time series
5. Classify tree crowns



Using unmanned
aerial systems for
the monitoring of
Belgium forests

Introduction

Measurement of
the vegetation
height

Discrimination of
tree species

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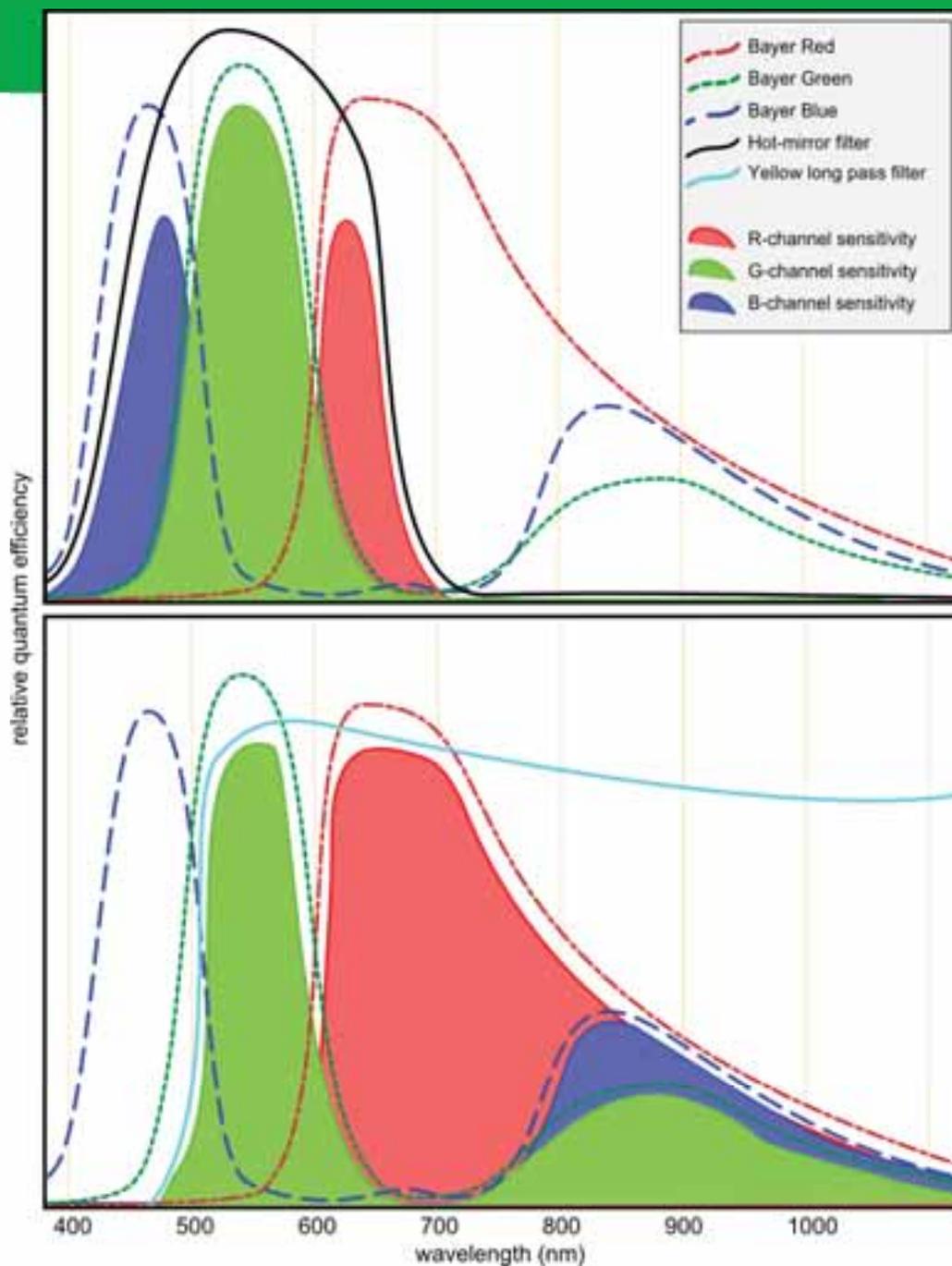


Using unmanned aerial systems for the monitoring of Belgium forests

Introduction

Measurement of the vegetation height

Discrimination of tree species



courtesy : Rogier de Jong 15 / 20

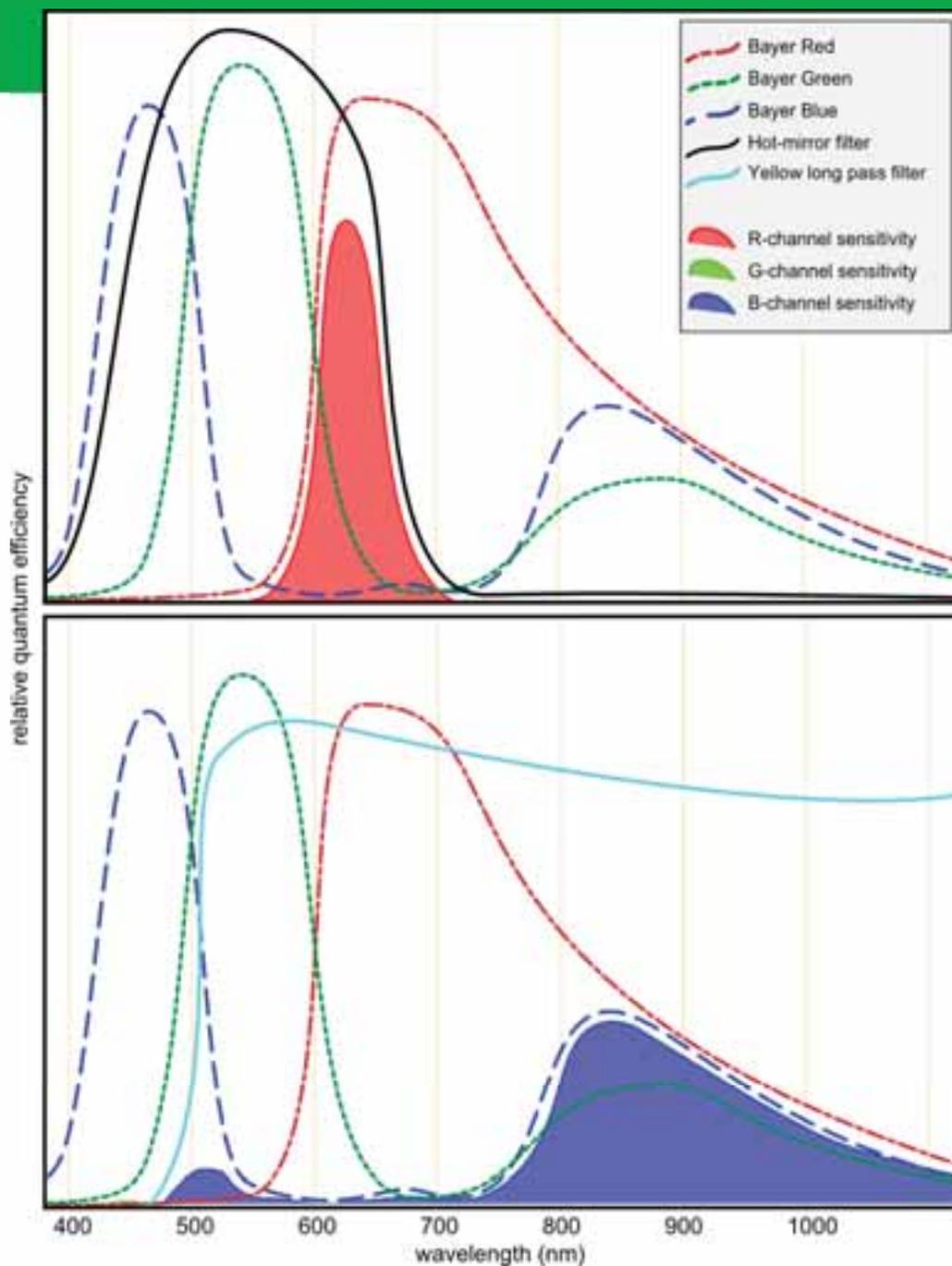


Using unmanned aerial systems for the monitoring of Belgium forests

Introduction

Measurement of the vegetation height

Discrimination of tree species



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Using unmanned aerial systems for the monitoring of Belgium forests

Introduction

Measurement of the vegetation height

Discrimination of tree species



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Introduction

Measurement of the vegetation height

Discrimination of tree species



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aerial systems for
the monitoring of
Belgium forests

Introduction

Measurement of
the vegetation
height

Discrimination of
tree species



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aerial systems for
the monitoring of
Belgium forests

Introduction

Measurement of
the vegetation
height

Discrimination of
tree species

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you for
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attention*



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