Terrestrial Laser Scanners for determination of biomass

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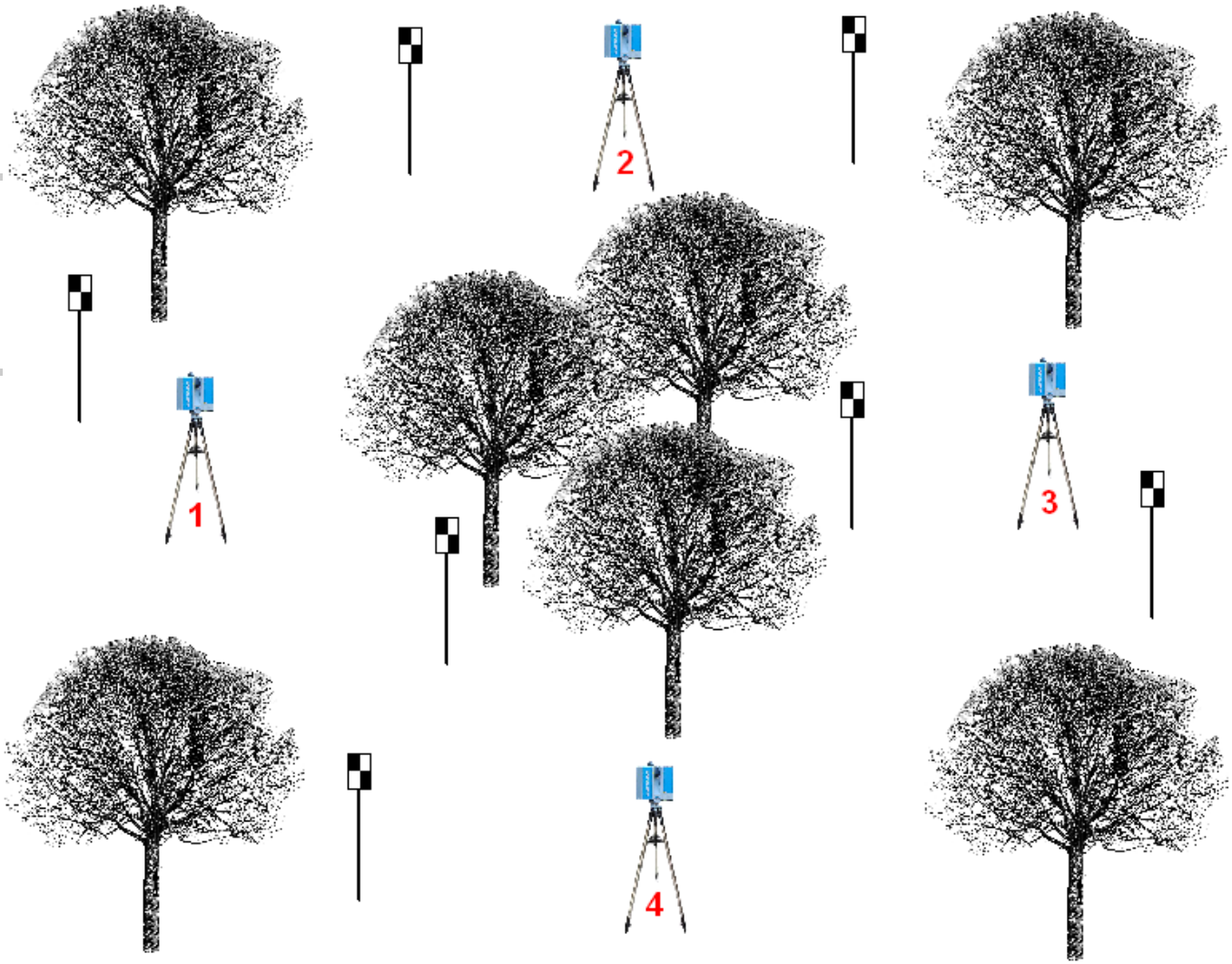
1. Light detection and Ranging (LiDAR)

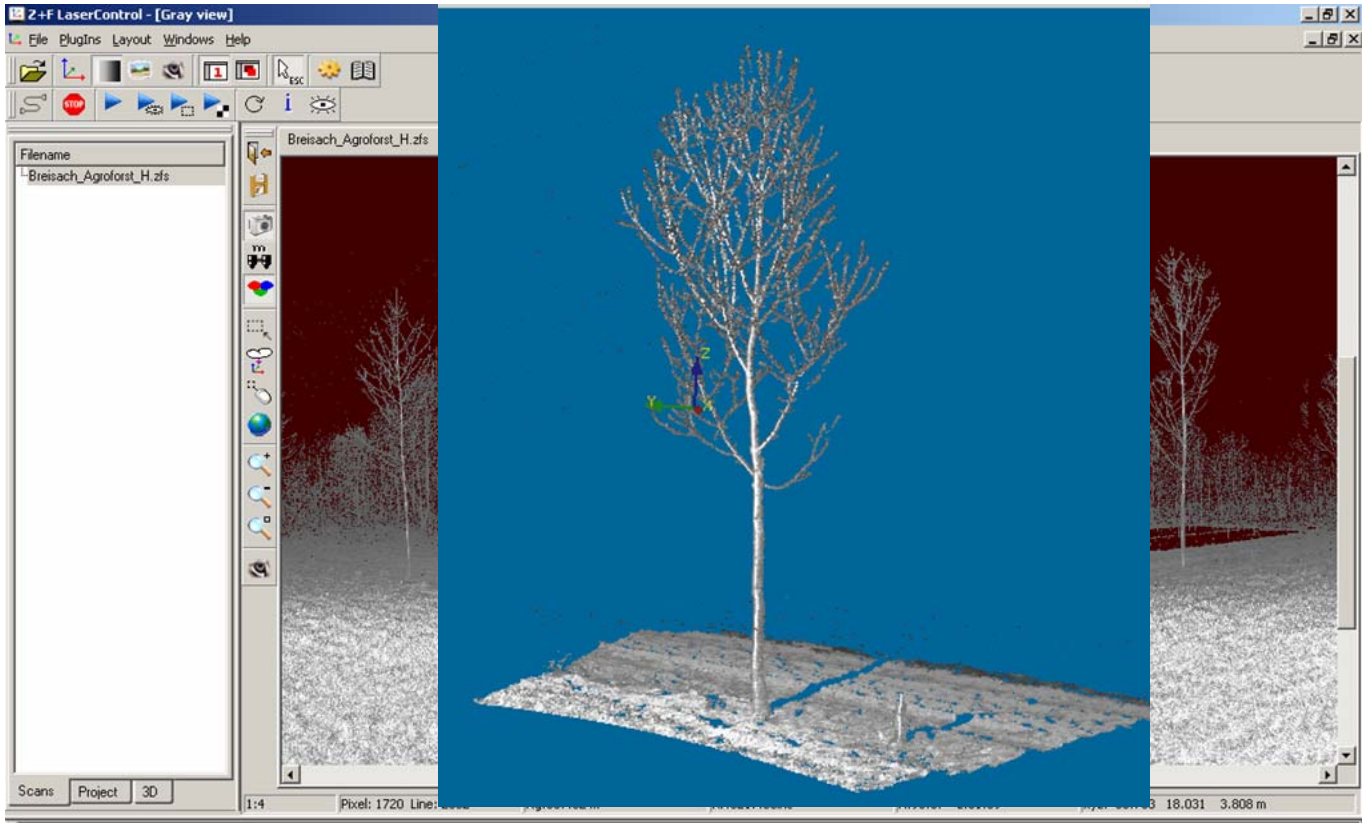
1.

2.



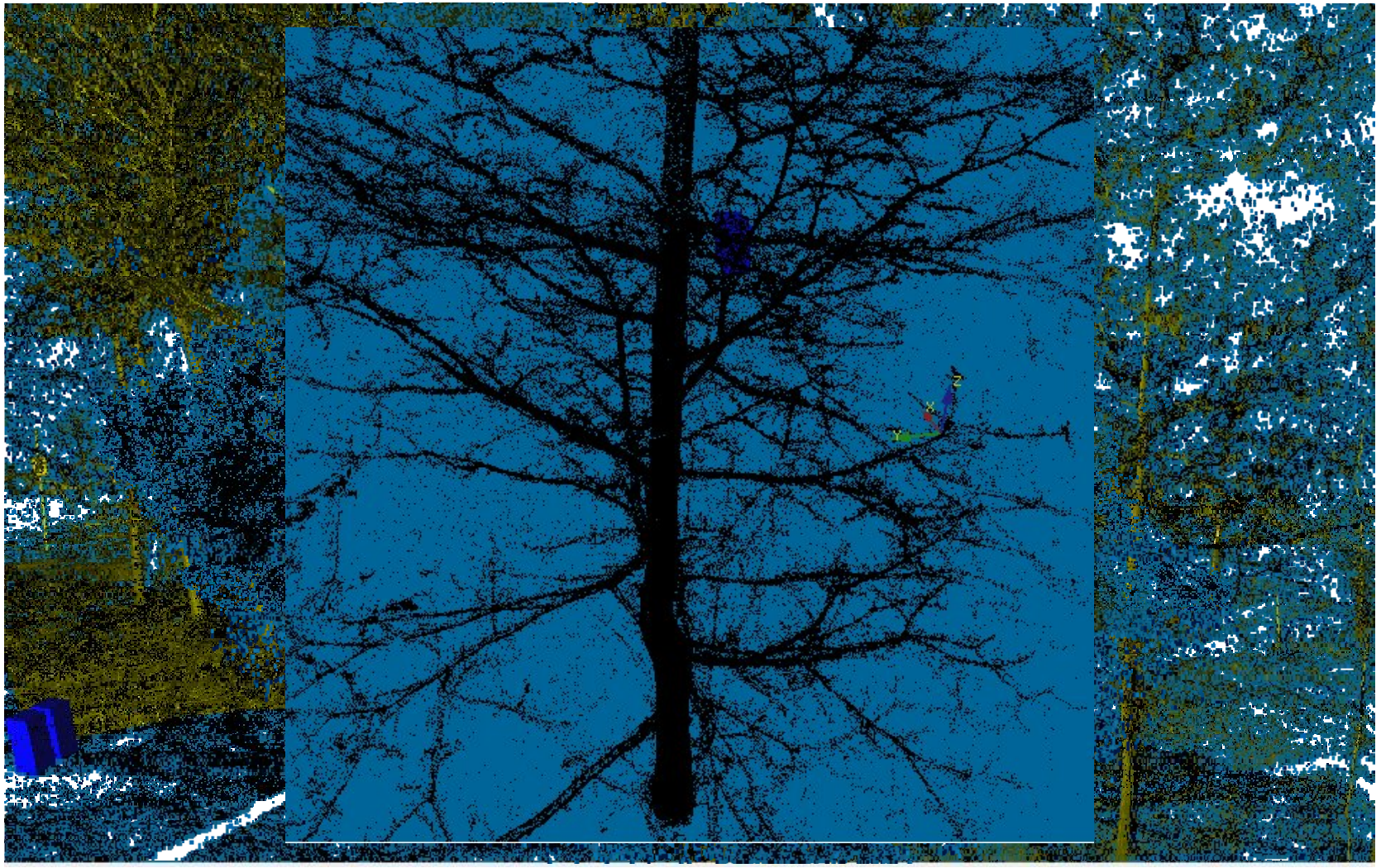
TLS

- High amount of data (multiple > single scan)



→ Main task: filtering „get what you want“

2. Multiple scan modus



3. Single scan modus

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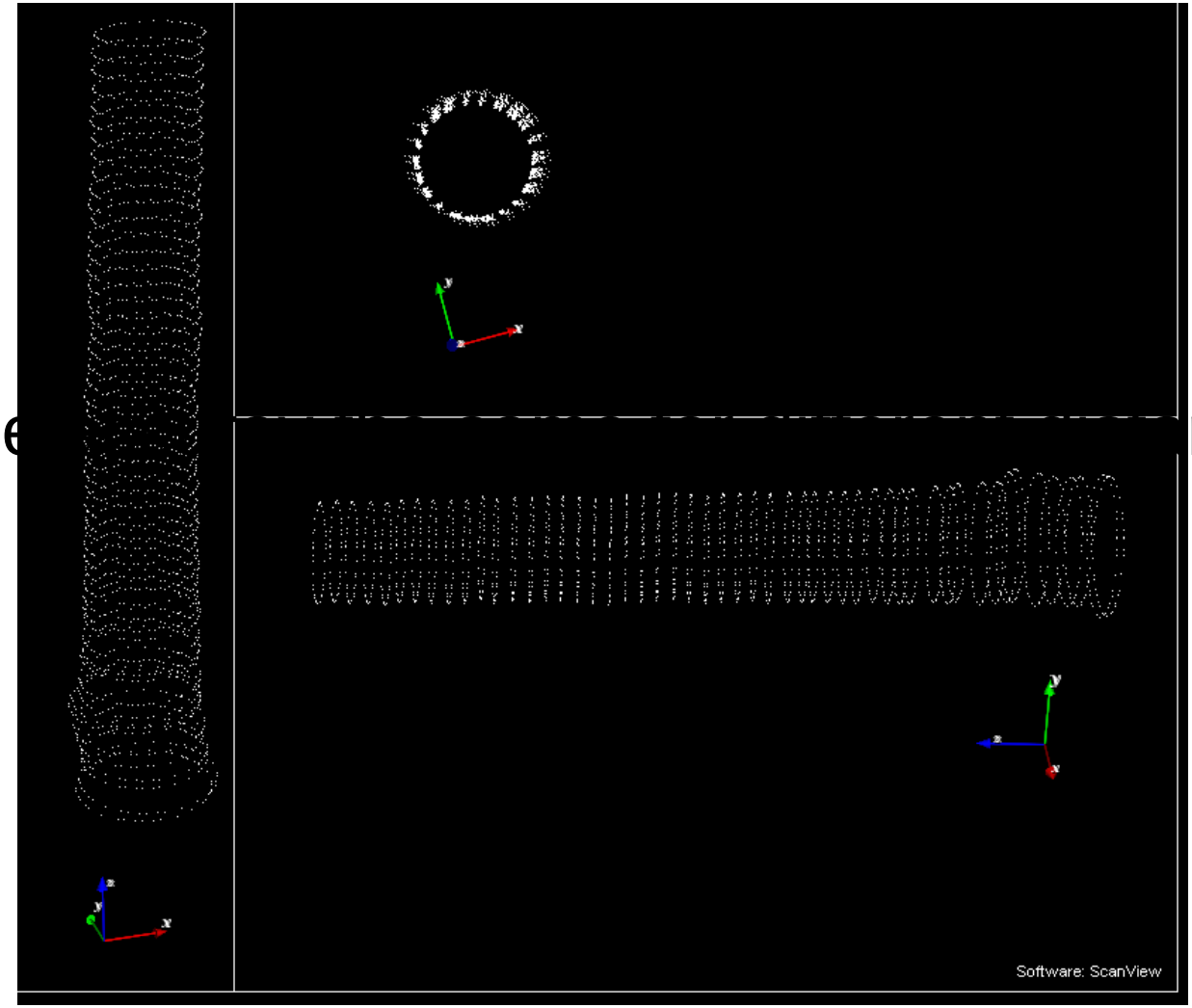
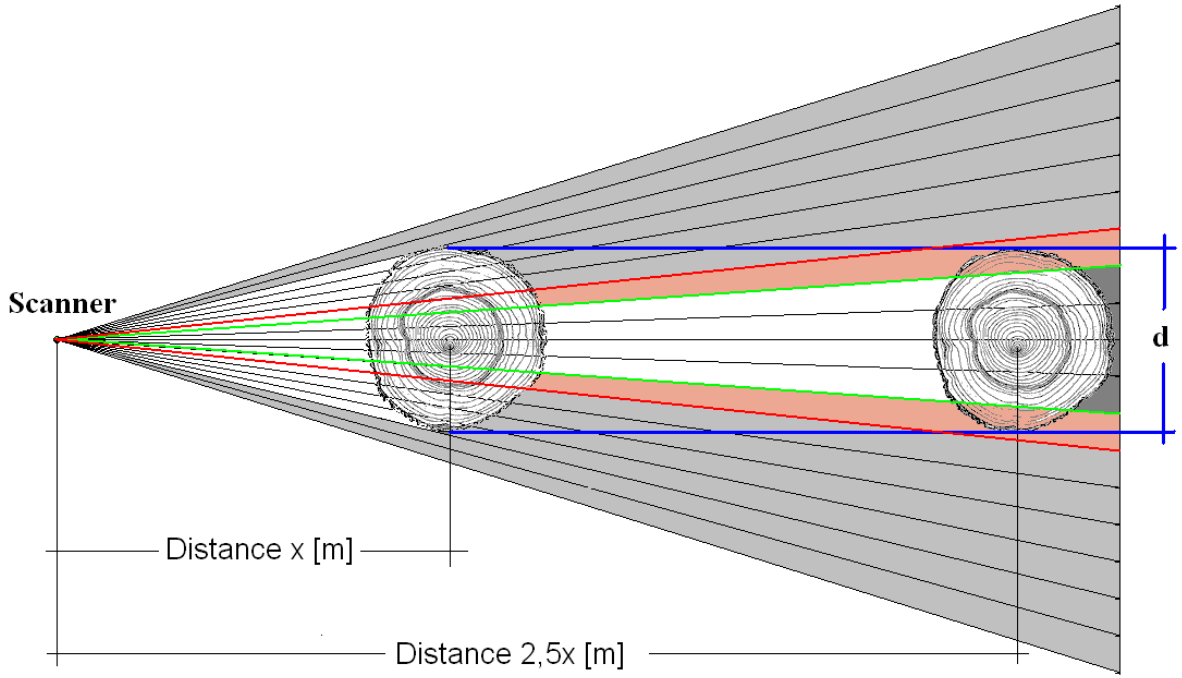


Is the nces?

4. Results

Diameter estimation (single scan)

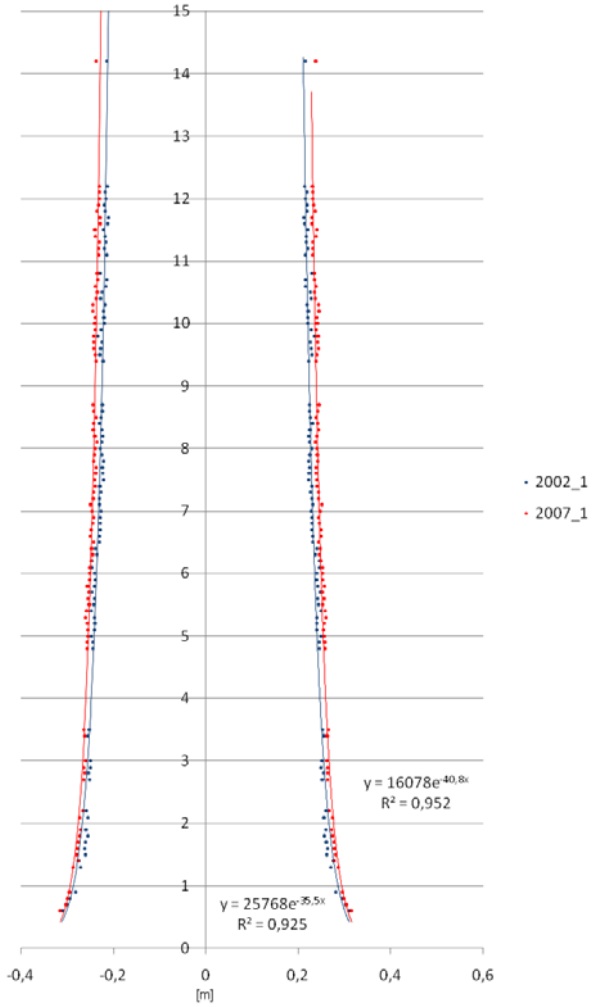
- Increasing distance → decreasing amount of information



4. Results: Volume (single tree)

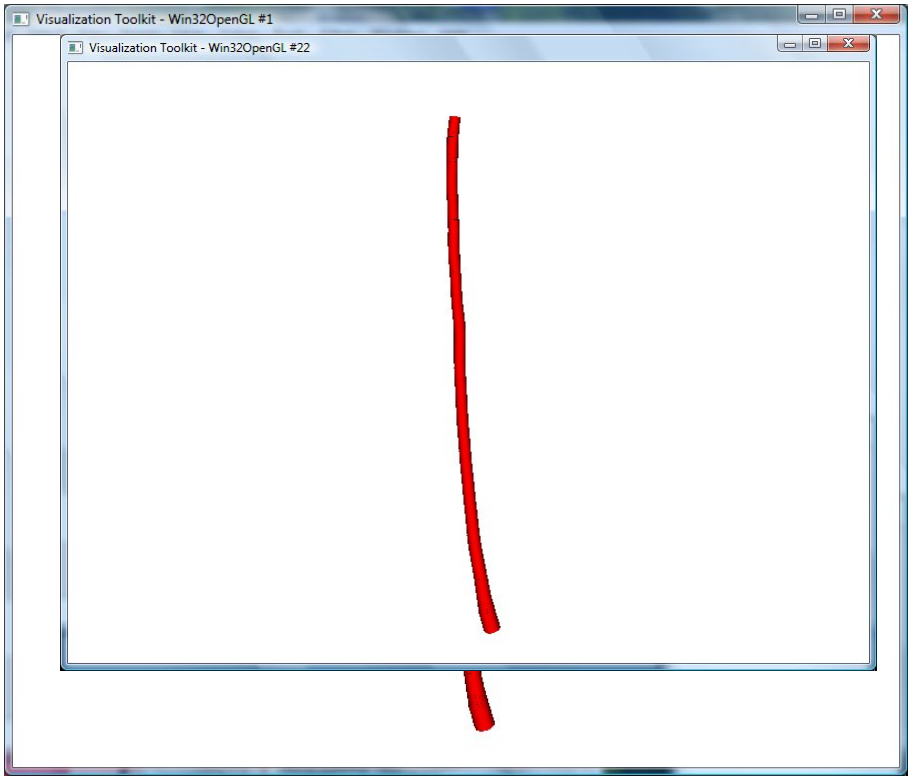
- Based on diameter measurements in different heights
- Same tree in 2002 and 2007

Height [m]	Model 2007 added [%]
0-1	11.4
1-2	21.3
2-3	30.0
3-4	38.0
4-5	45.4
5-6	52.5
6-7	59.2
7-8	65.6
8-9	71.8
9-10	77.9
10-11	83.7
11-12	89.4
12-13	94.9
13-14	100.0
Sum	0.0
Deviation TLS - Modell	



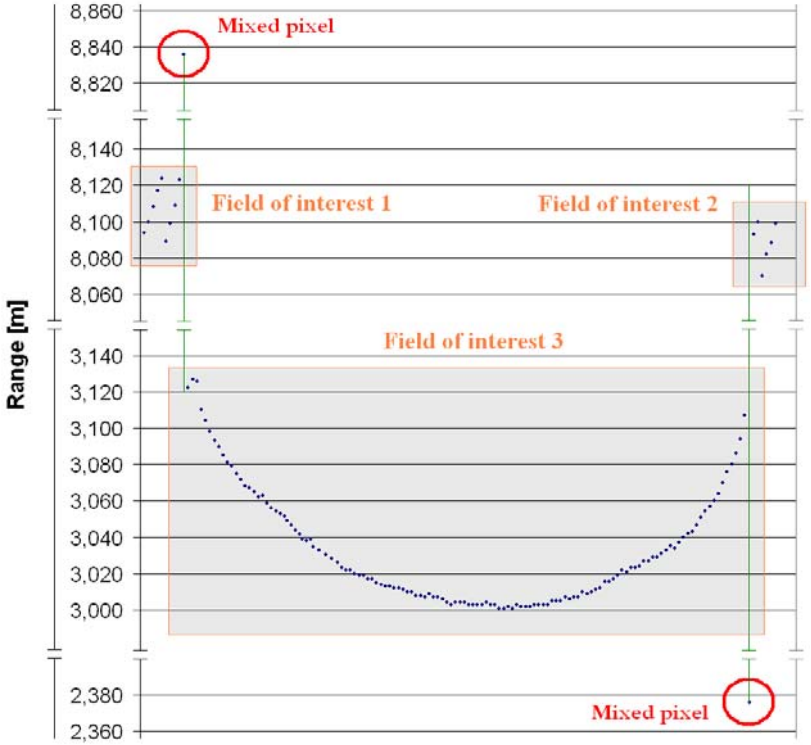
4. Results

Cylinder approximation



5. Influences on the accuracy

- Outside influences like wind, rain and snow
- Technique of the scanner
- Software used to analyze the data



6. Advantages and disadvantages

+ Very accurate technique
+ Objective technique
+ Data collection easy
+ Differences between datasets automatically detectable
+ retrospective measurements possible

- Quite time consuming
- Still some manual work required
- Problem: Occlusion
- Expensive (1000€ per day)

7. Outlook

- Connection to additional data sources (RGB images already possible)
- Higher resolution
- Lower power required
- Mobile use possible (e.g. mountable on a bag pack or vehicle)

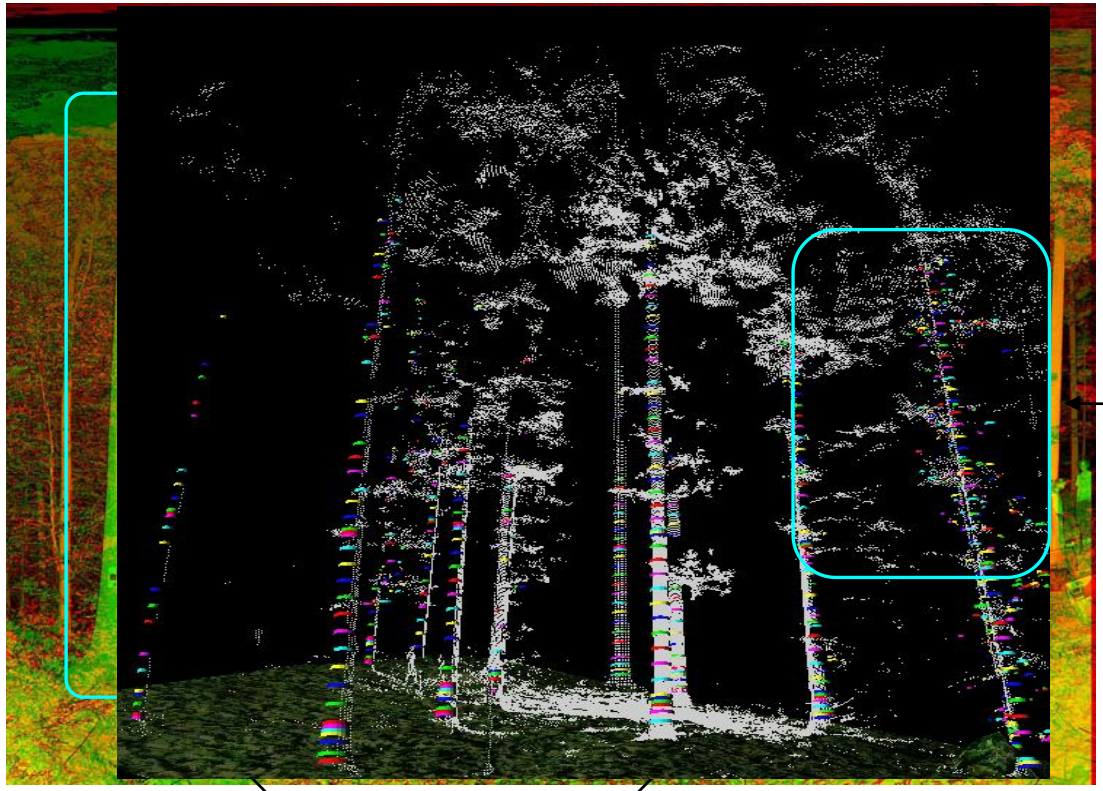
→ Vision of forest inventories

7. Outlook

TLS for forest inventory

TLS: Z+F Imager 5006

Years: 2002 and 2007



8. Summary

- Fast & effective technique
- Key: data processing
- Tool for the future

Thank you for your attention!

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