



Applied Period Presentation

Identification of tree rings of *Nothofagus fusca*
based on anatomy and density measurement

Yan Huang

Supervisor: Dr. Hans-Peter Kahle

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UNIVERSITY OF
EASTERN FINLAND

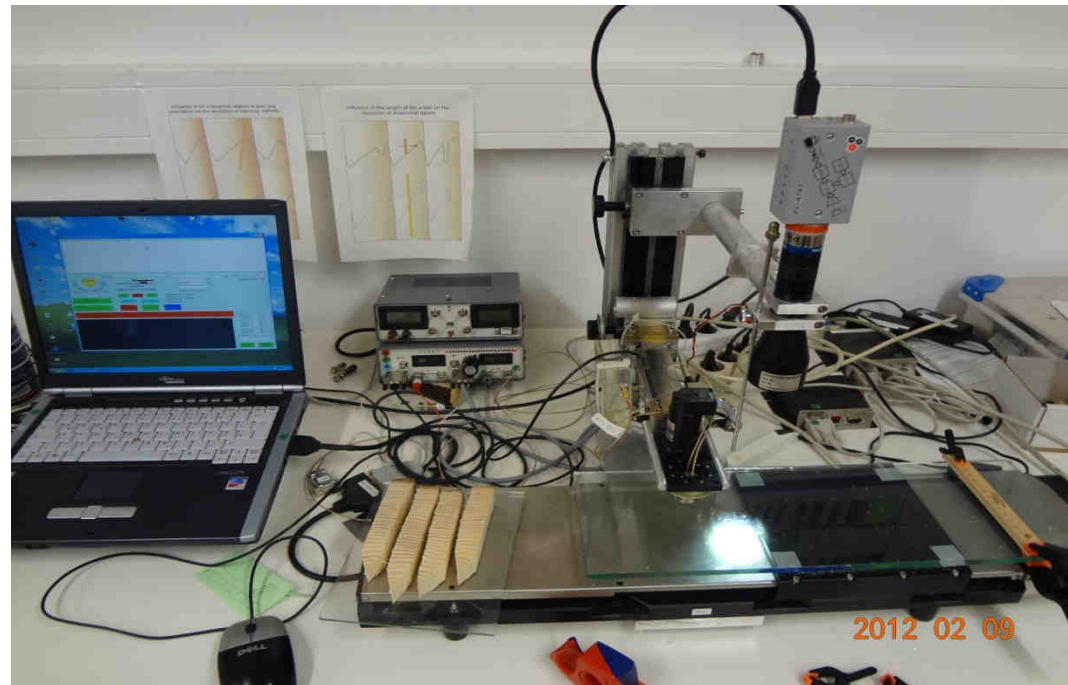


Research Problem

- Identification of tree rings
- Use of HF-densitometry to measure tree-ring density and determine wood density trends

Research Process

- Weekly meetings with Mr. Kahle
- Density measurement with HF-Densitometry
- Identification of rings with microscope(Johann and cell structure analysis)
- Density-hardness measurement with a new probe

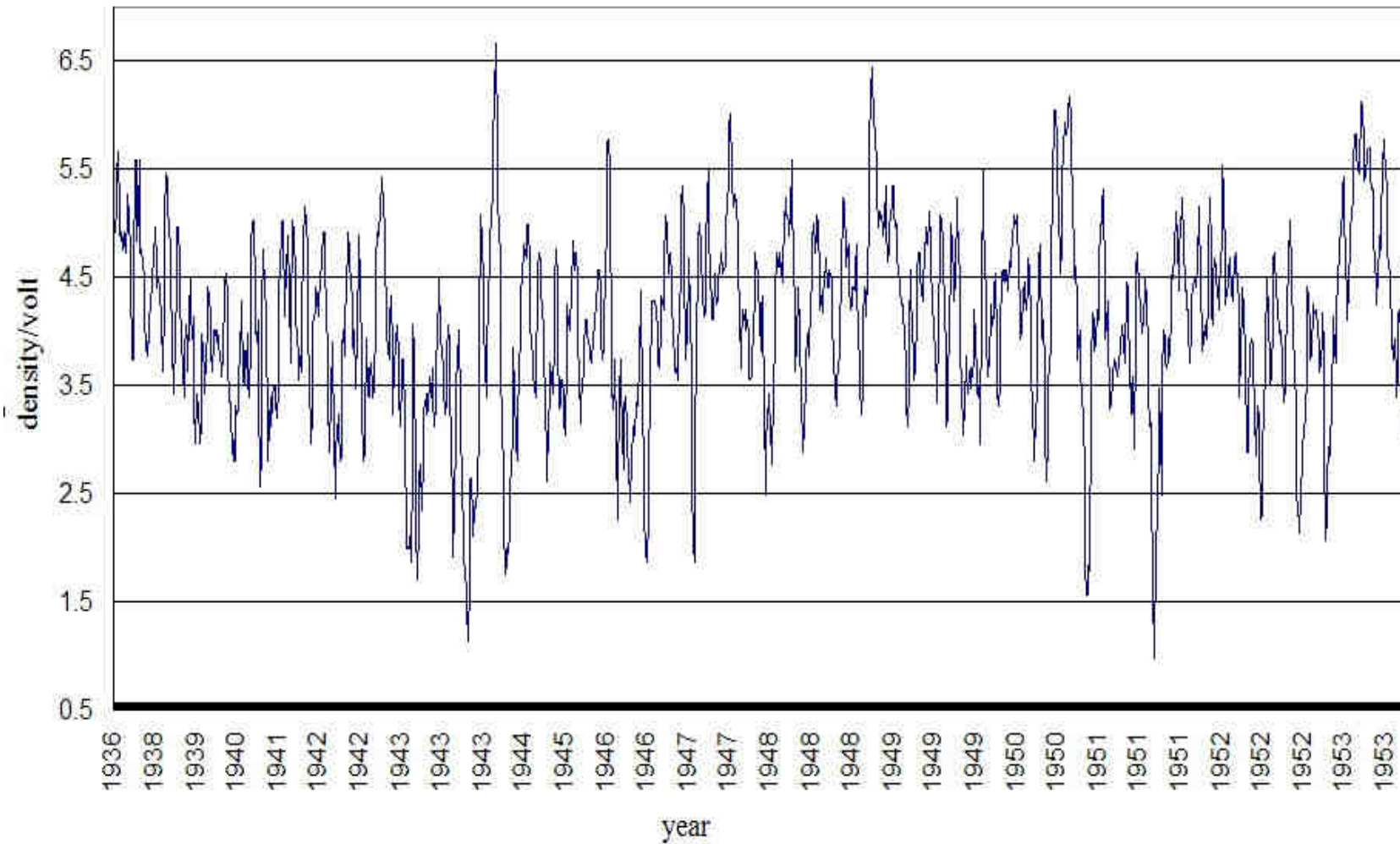


Nothofagus fusca

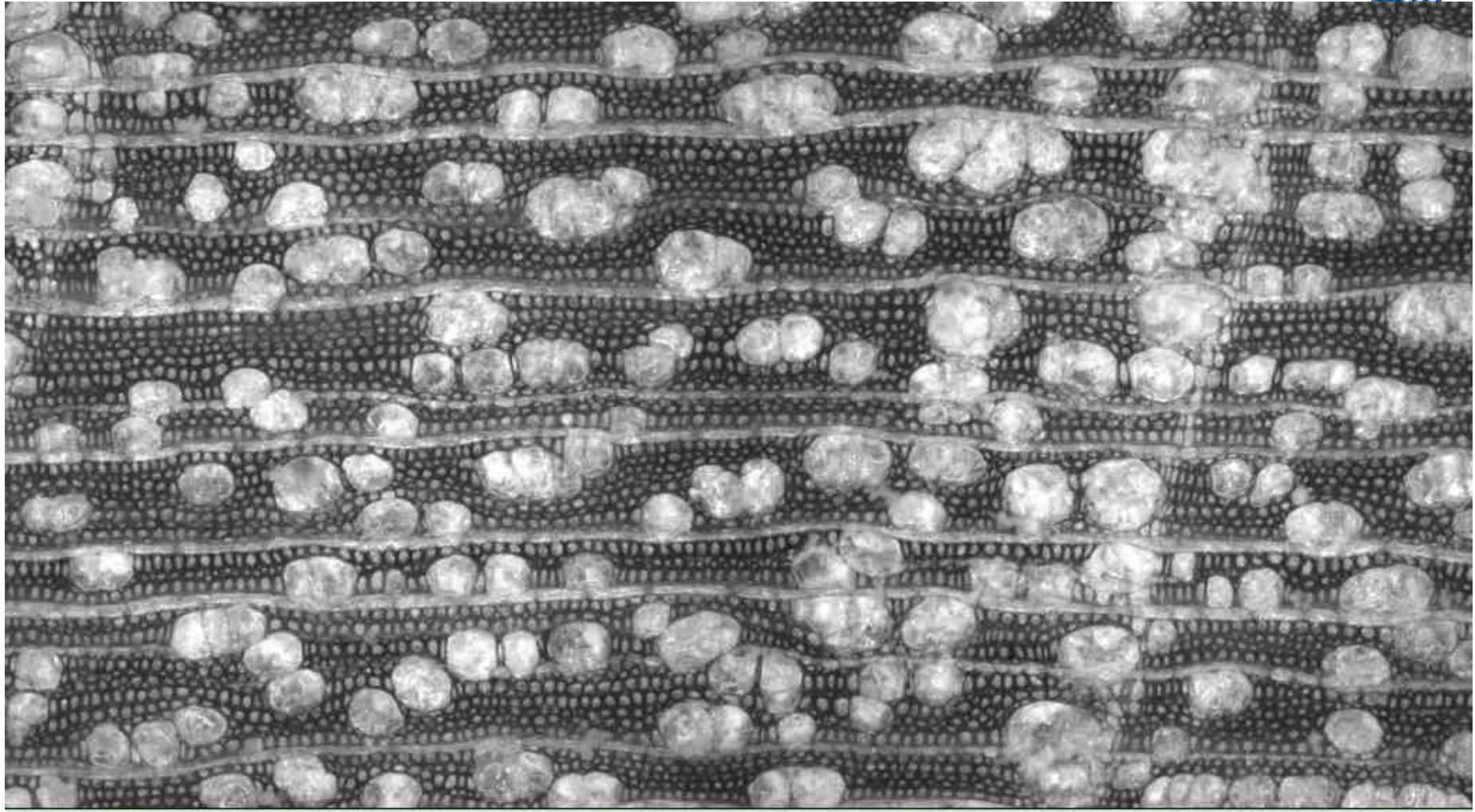


- medium-sized, evergreen tree, growing to 45 m tall.

Density Measurement



Microscopic Structure

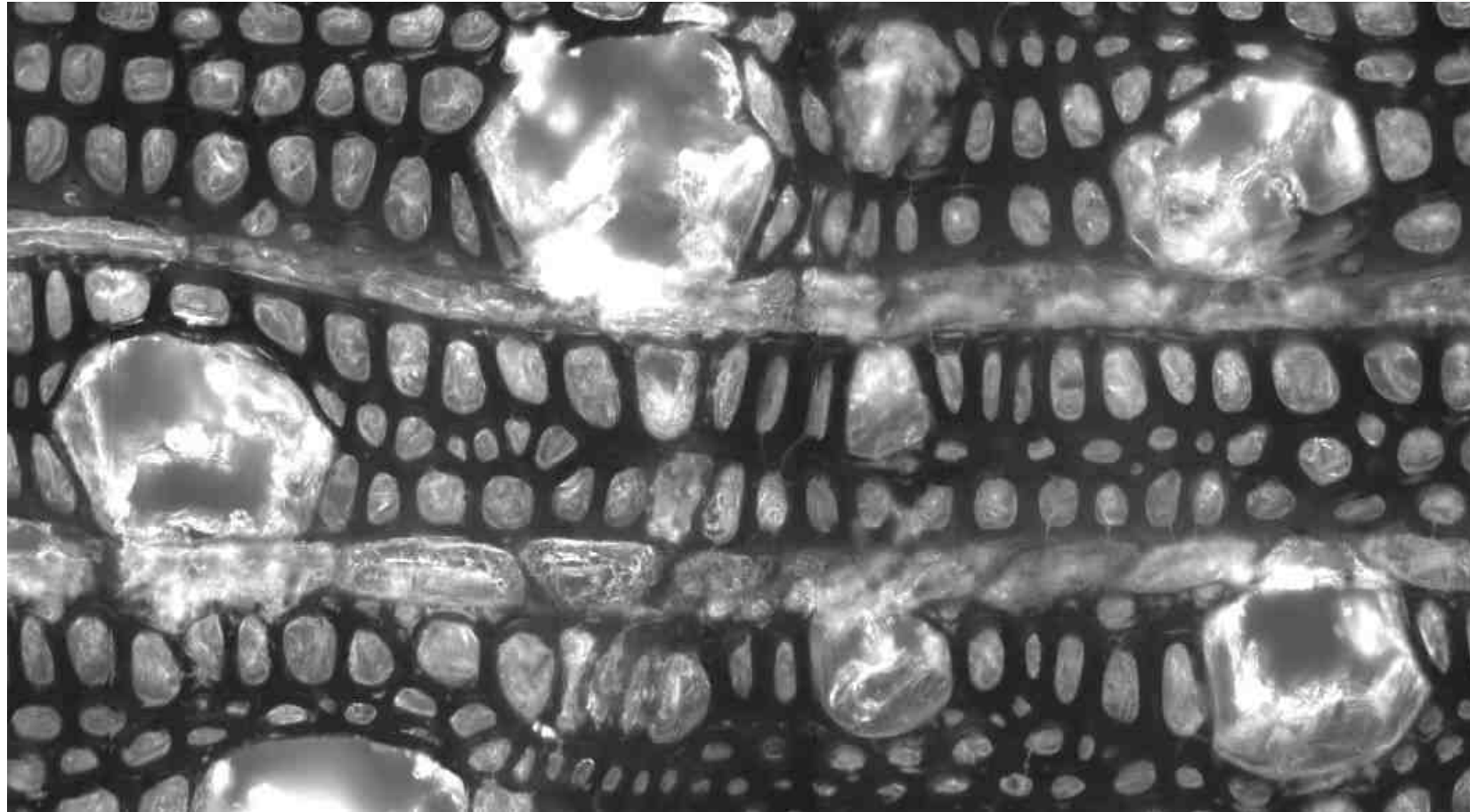


20x

Microscopic Structure



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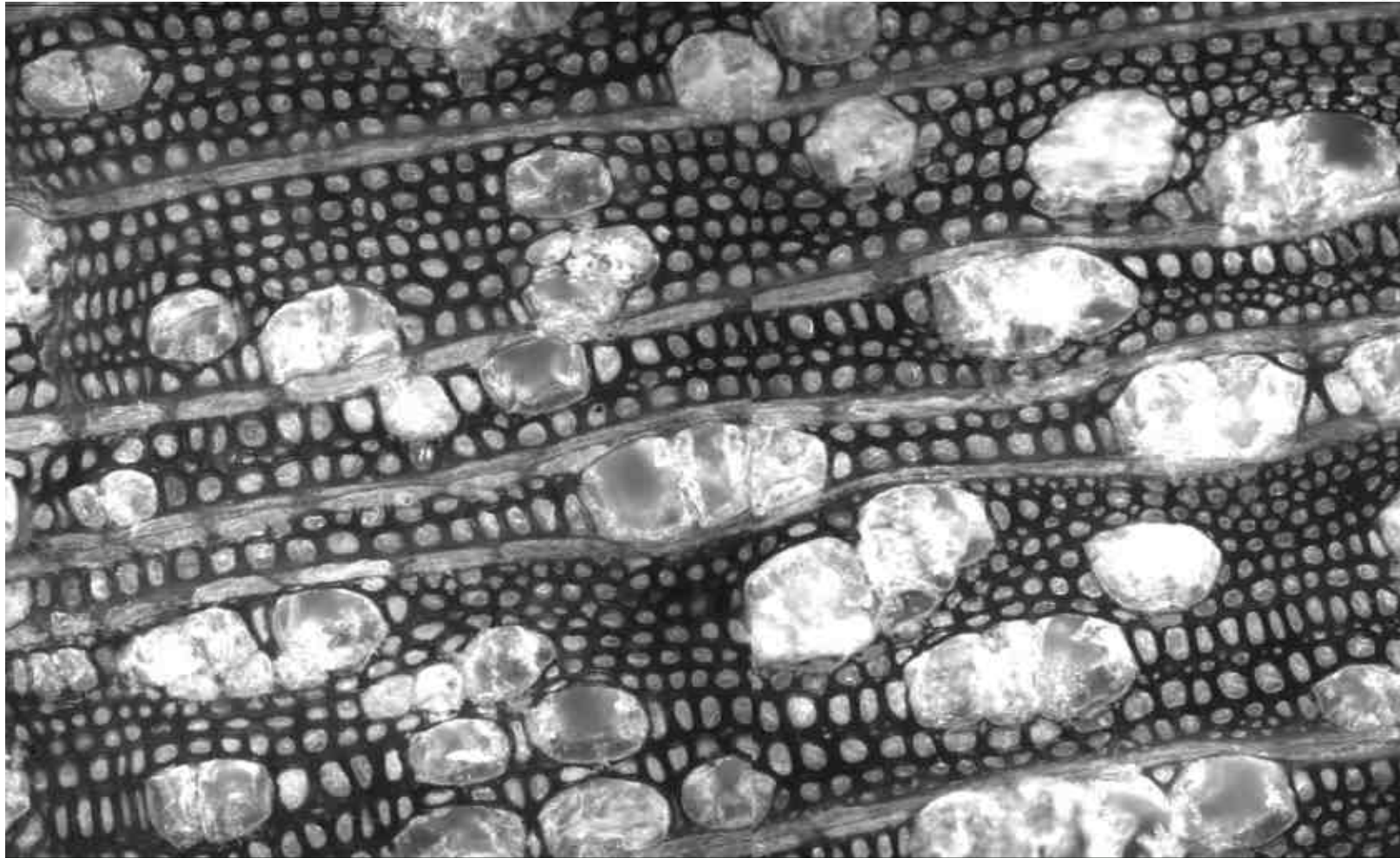


Growth ring boundaries distinct: growth rings with an abrupt structural change at the boundaries between them

Microscopic Structure

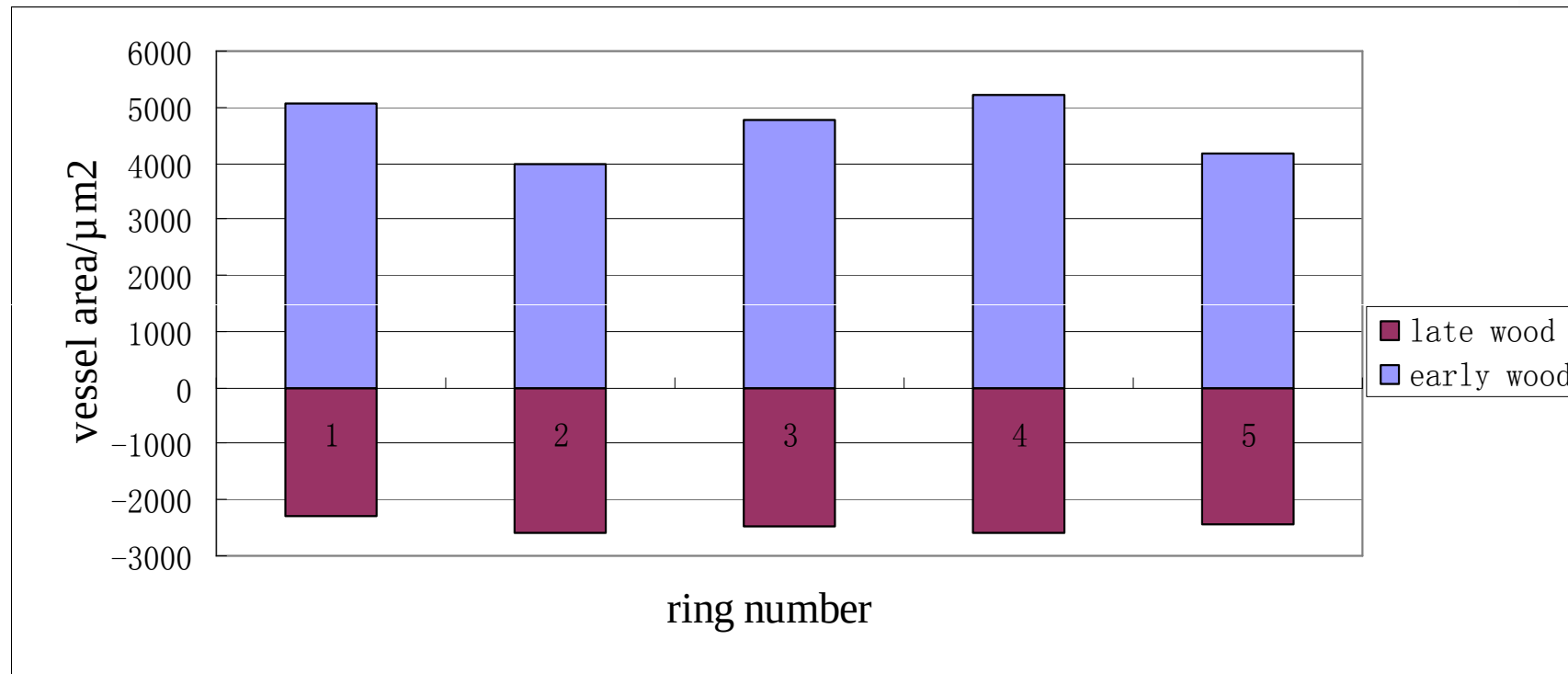


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Wood semi-ring-porous

Clear Tree Rings

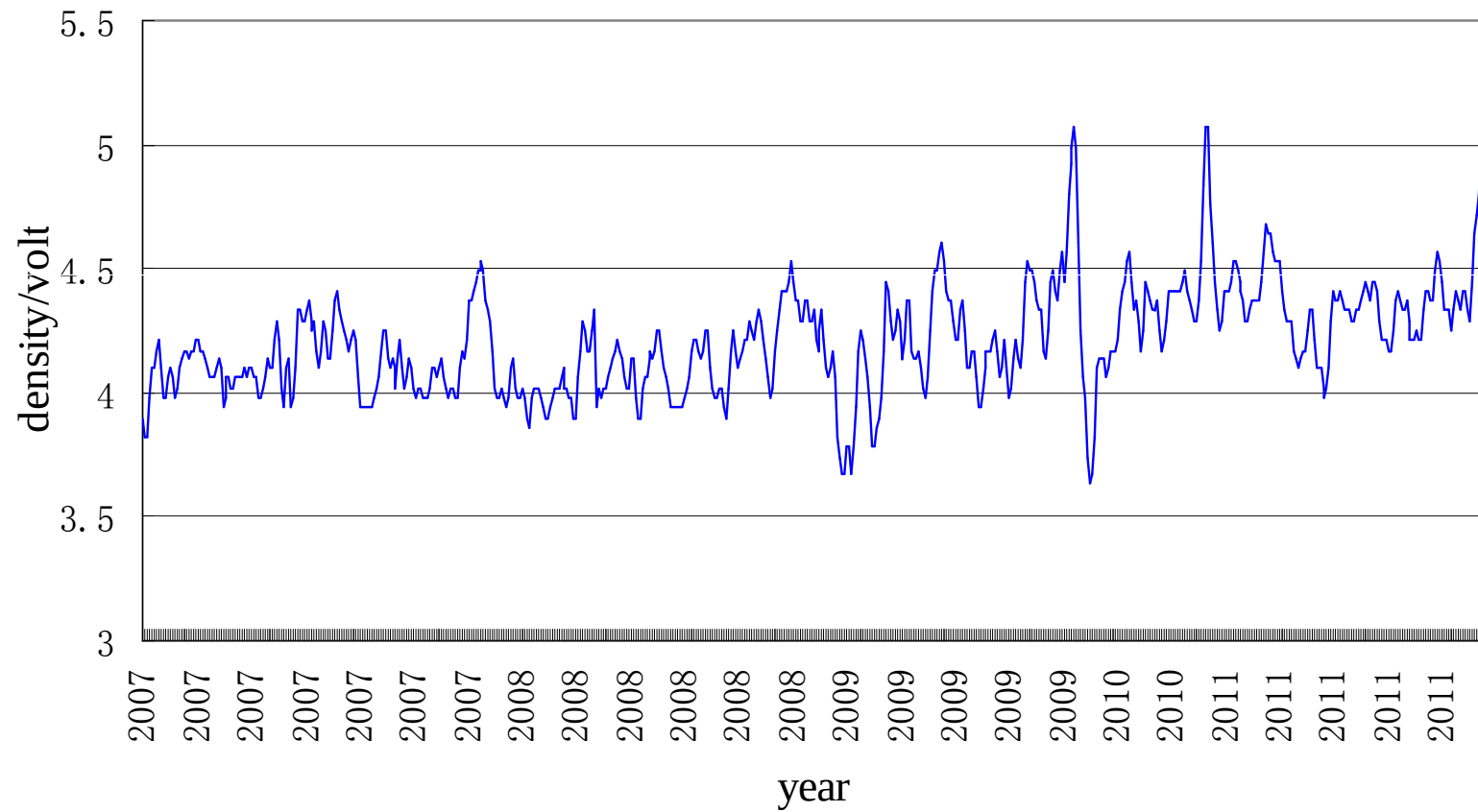


18b

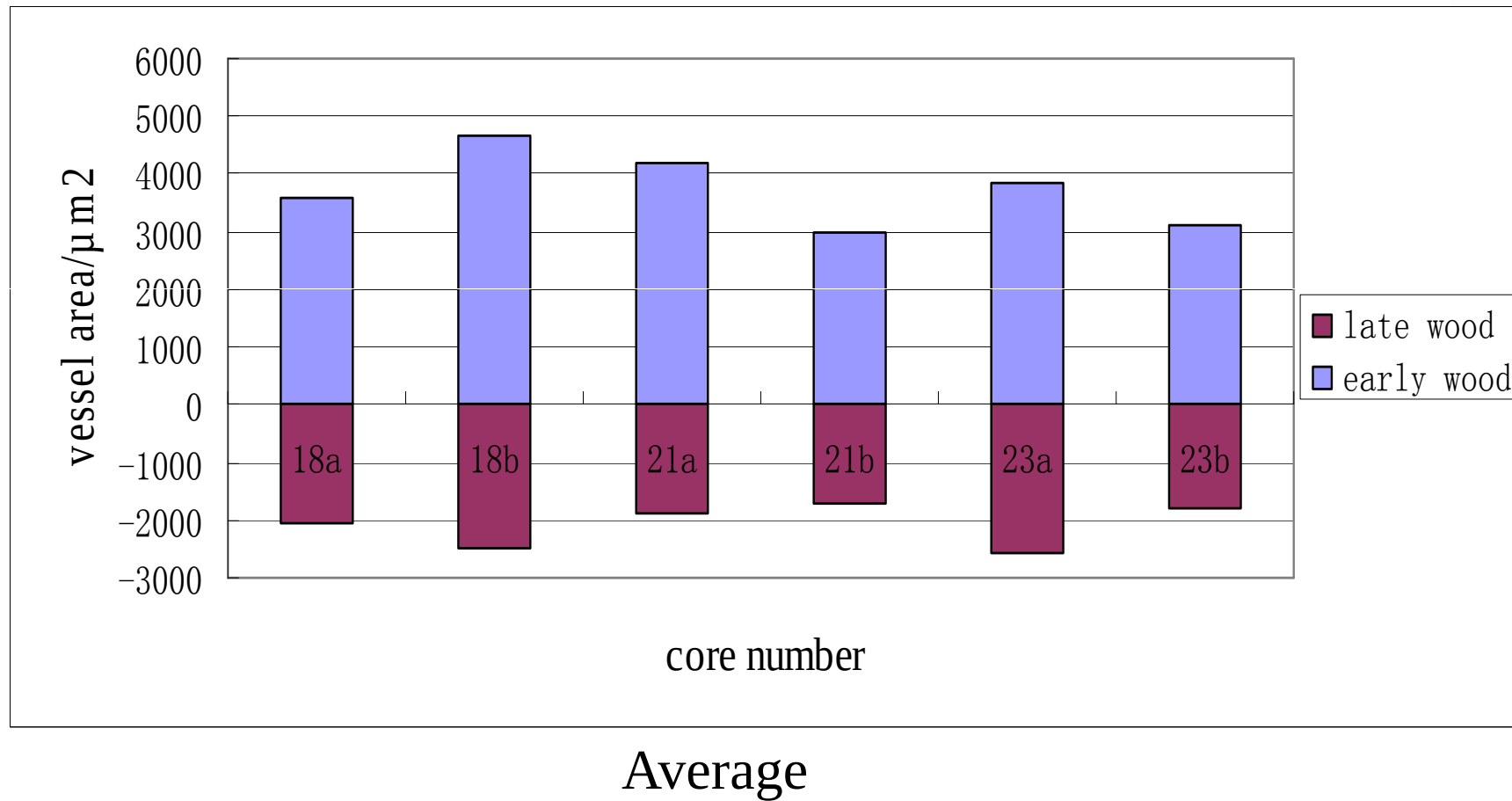
Clear tree rings means that the rings can be seen clearly visually

Density Measurement

18b



Clear Tree Rings

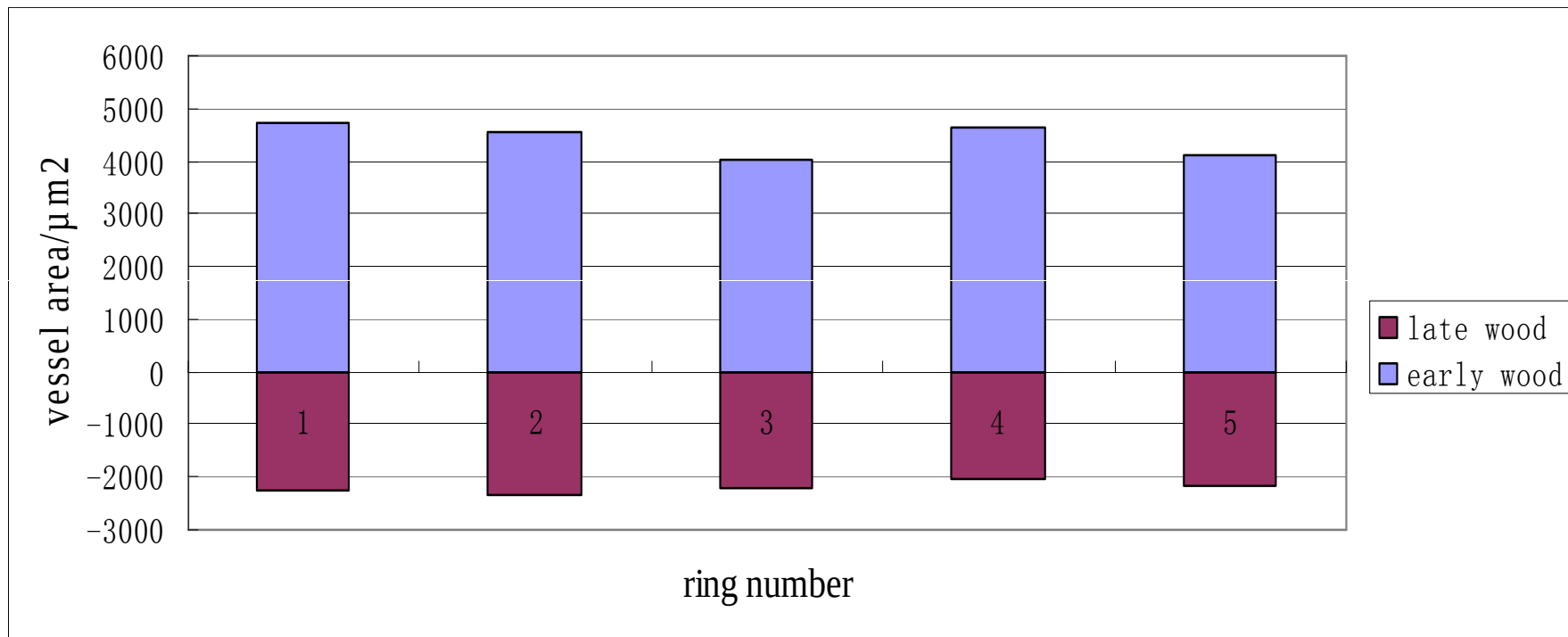


Clear Tree Rings

Independent Samples Test

Core NO.	18a	18b	21a	21b	23a	23b
Sig.	0.000	0.001	0.000	0.000	0.000	0.001

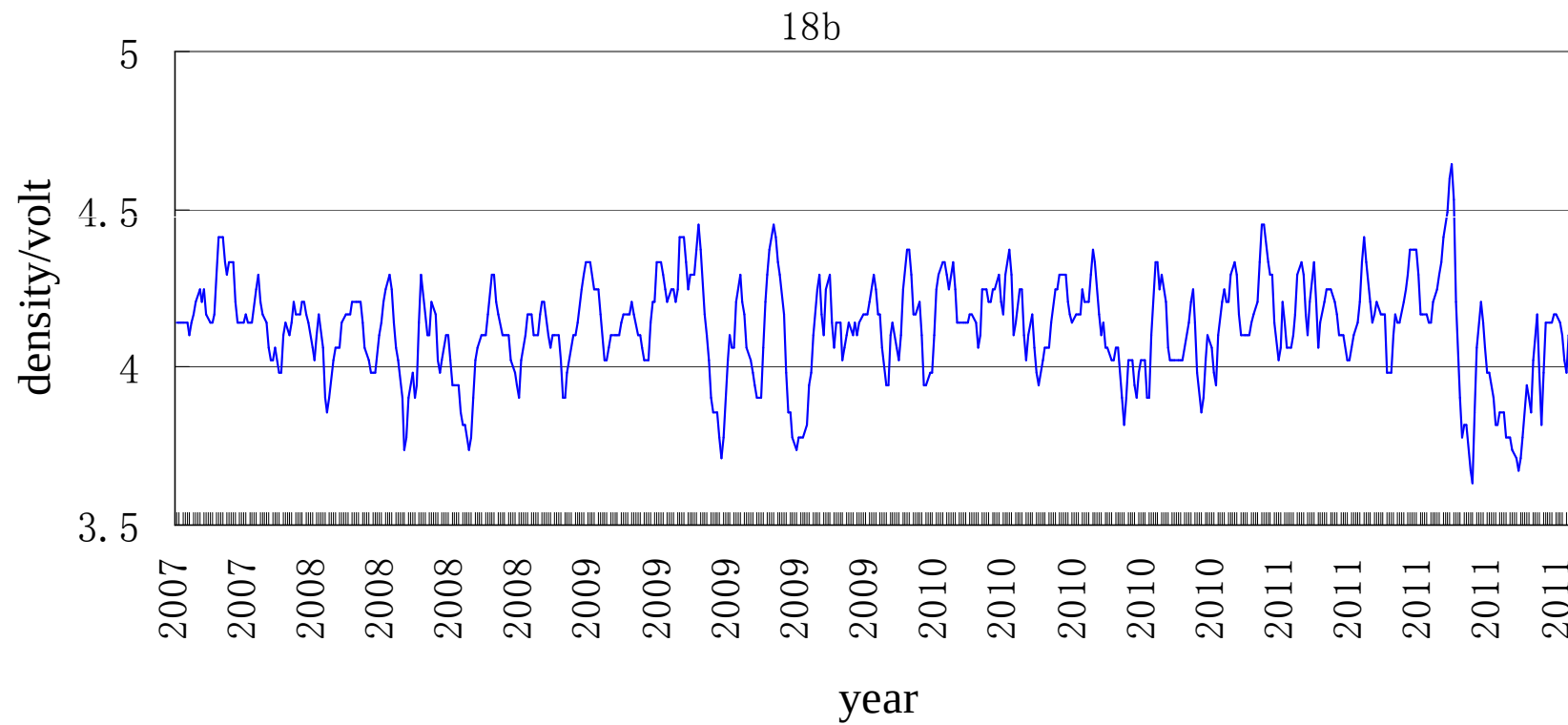
Not Clear Tree Rings



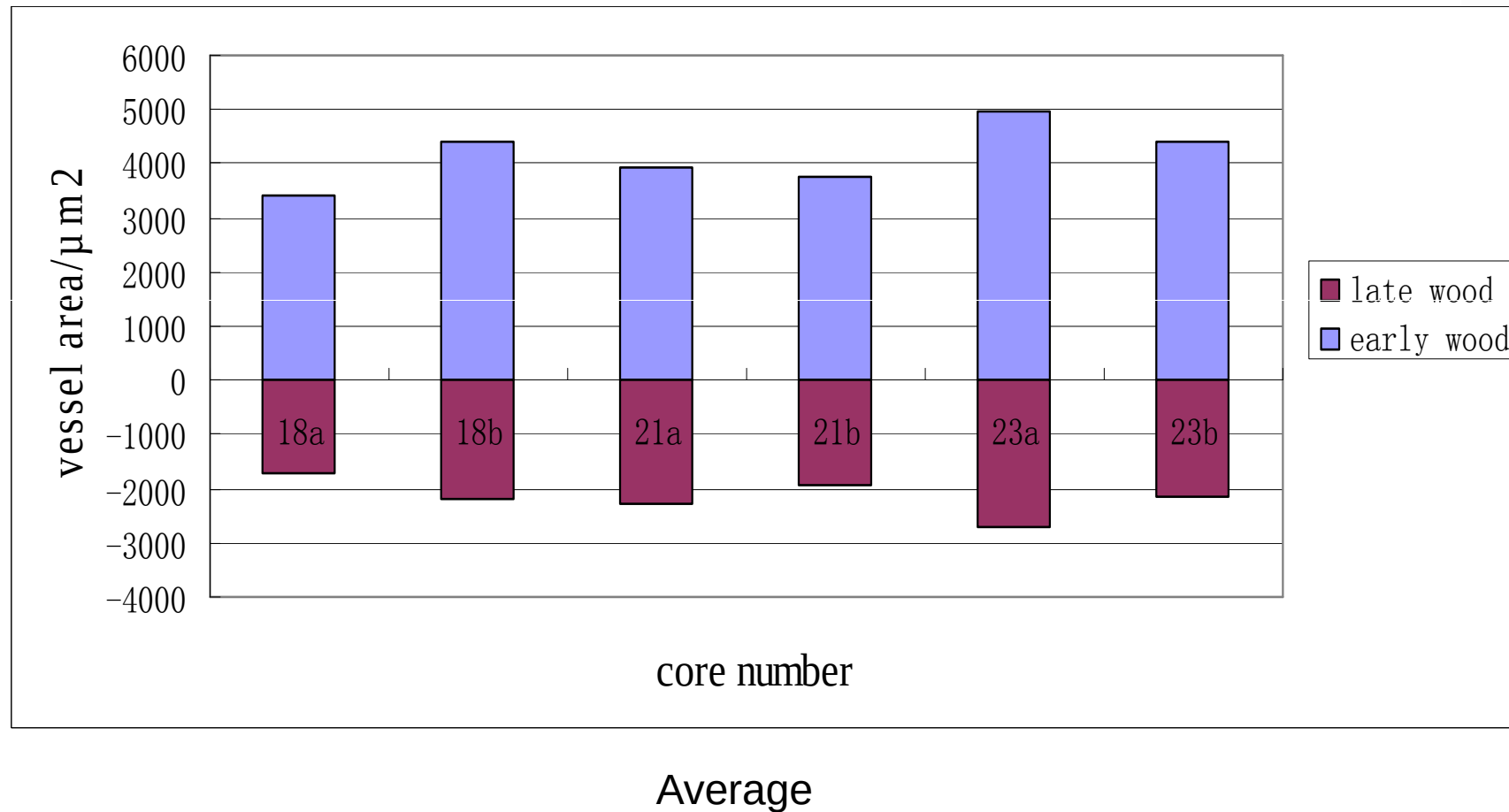
18b

Not clear rings means that the rings cannot be seen clearly by naked eyes

Density Measurement



Not Clear Tree Rings



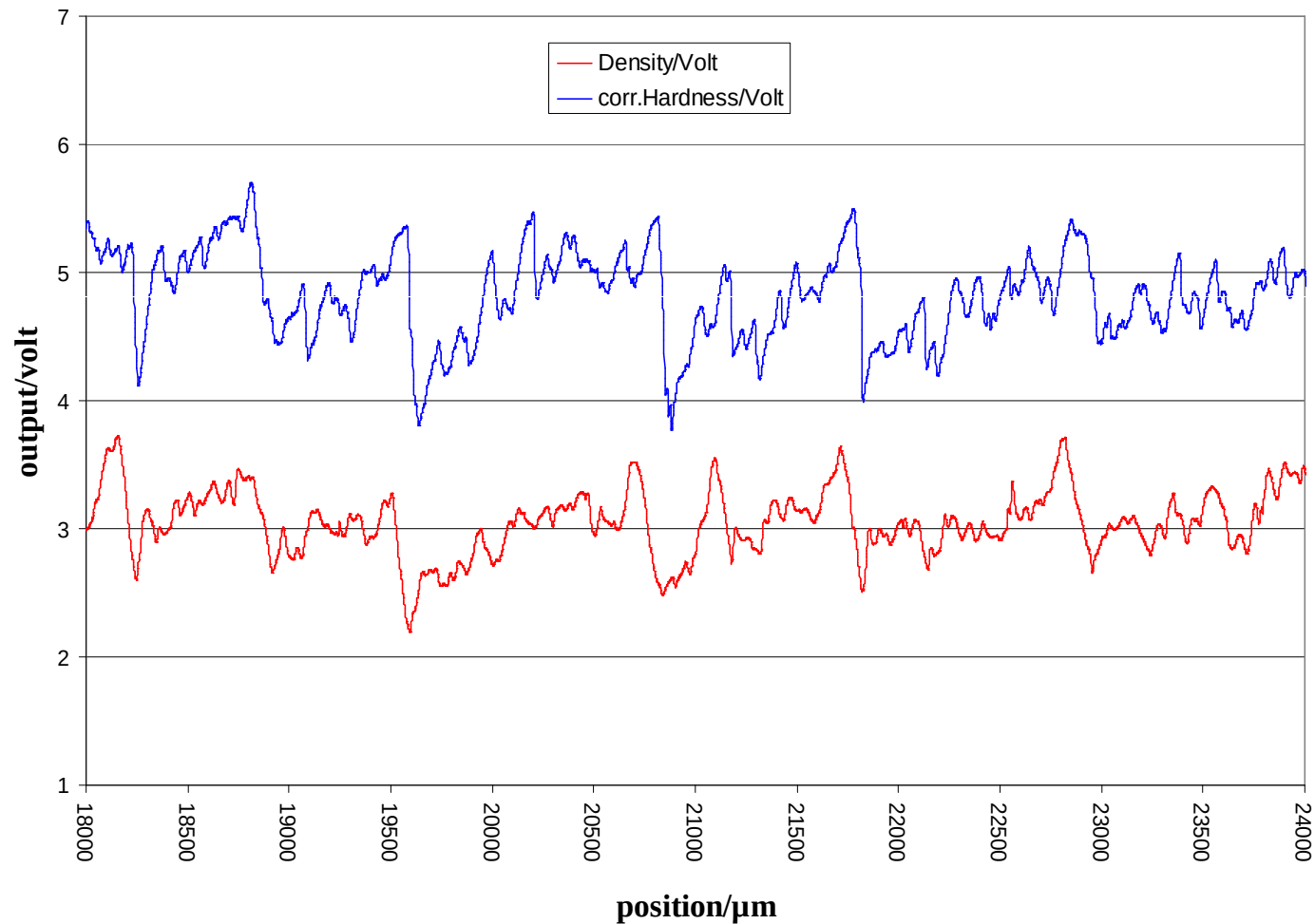
Not Clear Tree Rings

Independent Samples Test

Core NO.	18a	18b	21a	21b	23a	23b
Sig.	0.006	0.000	0.000	0.000	0.000	0.000

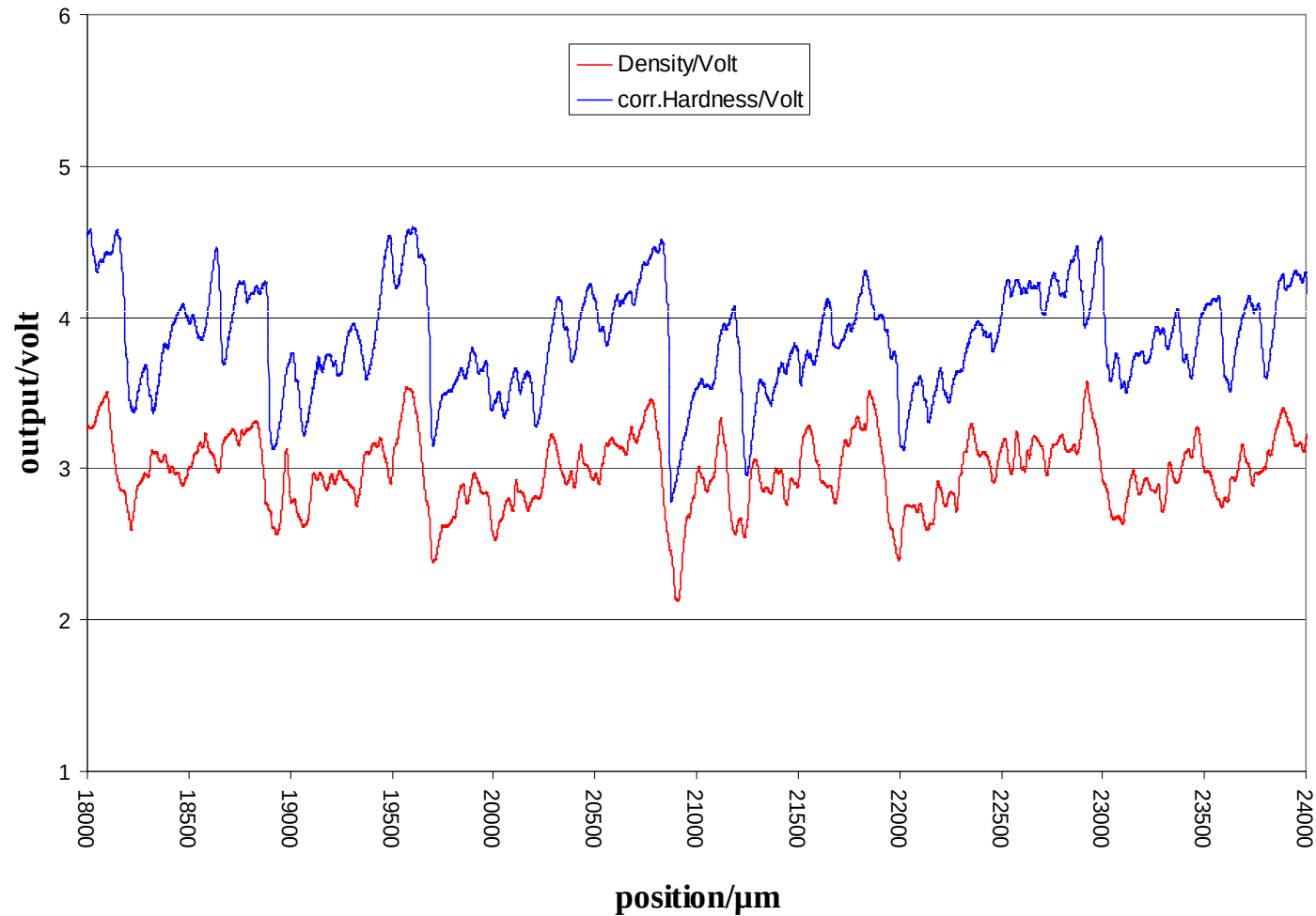
Density-Hardness Measurement

Nothofagus fusca, corr.Density-Hardness, sample 18b, 1 run

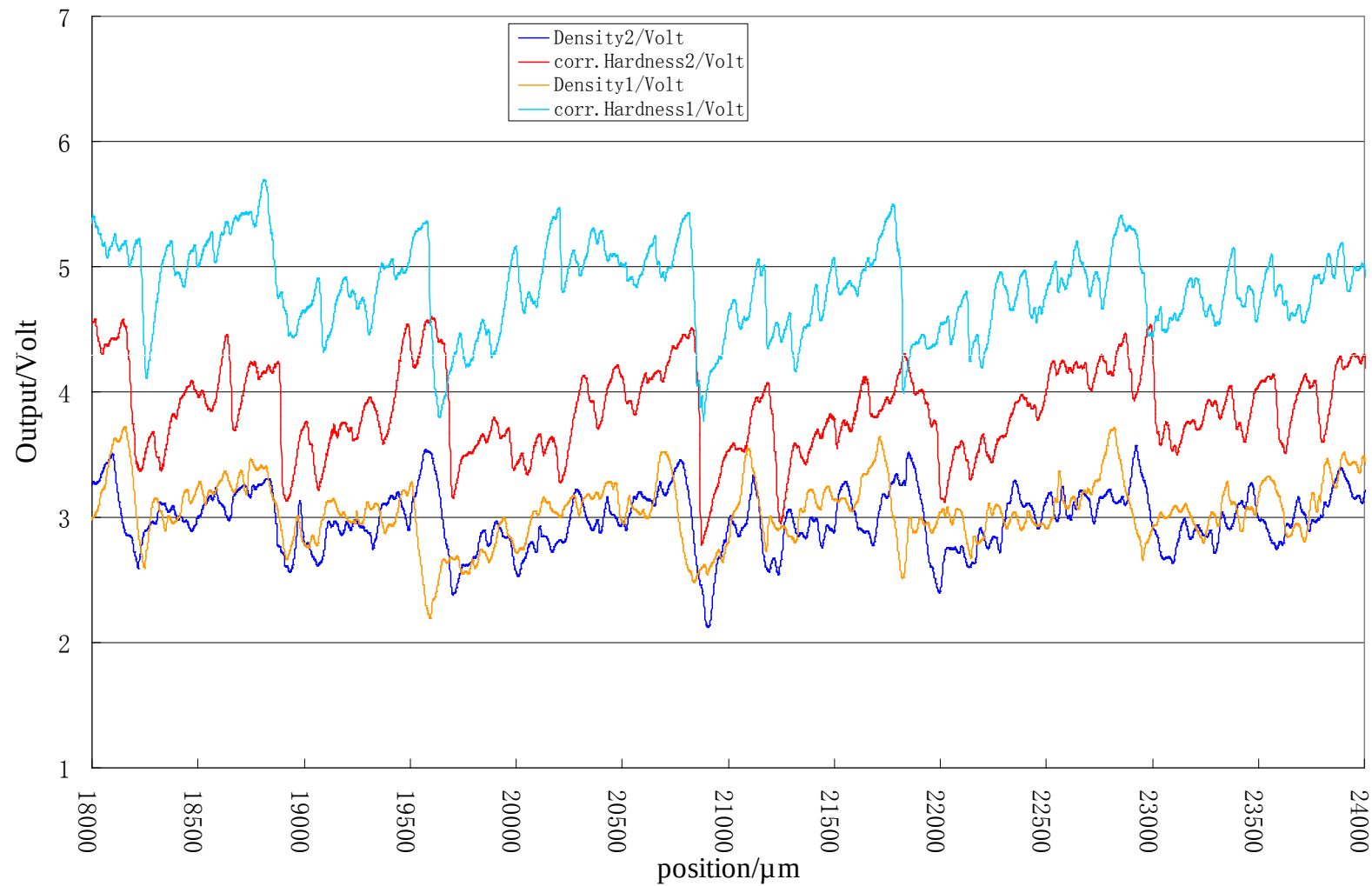


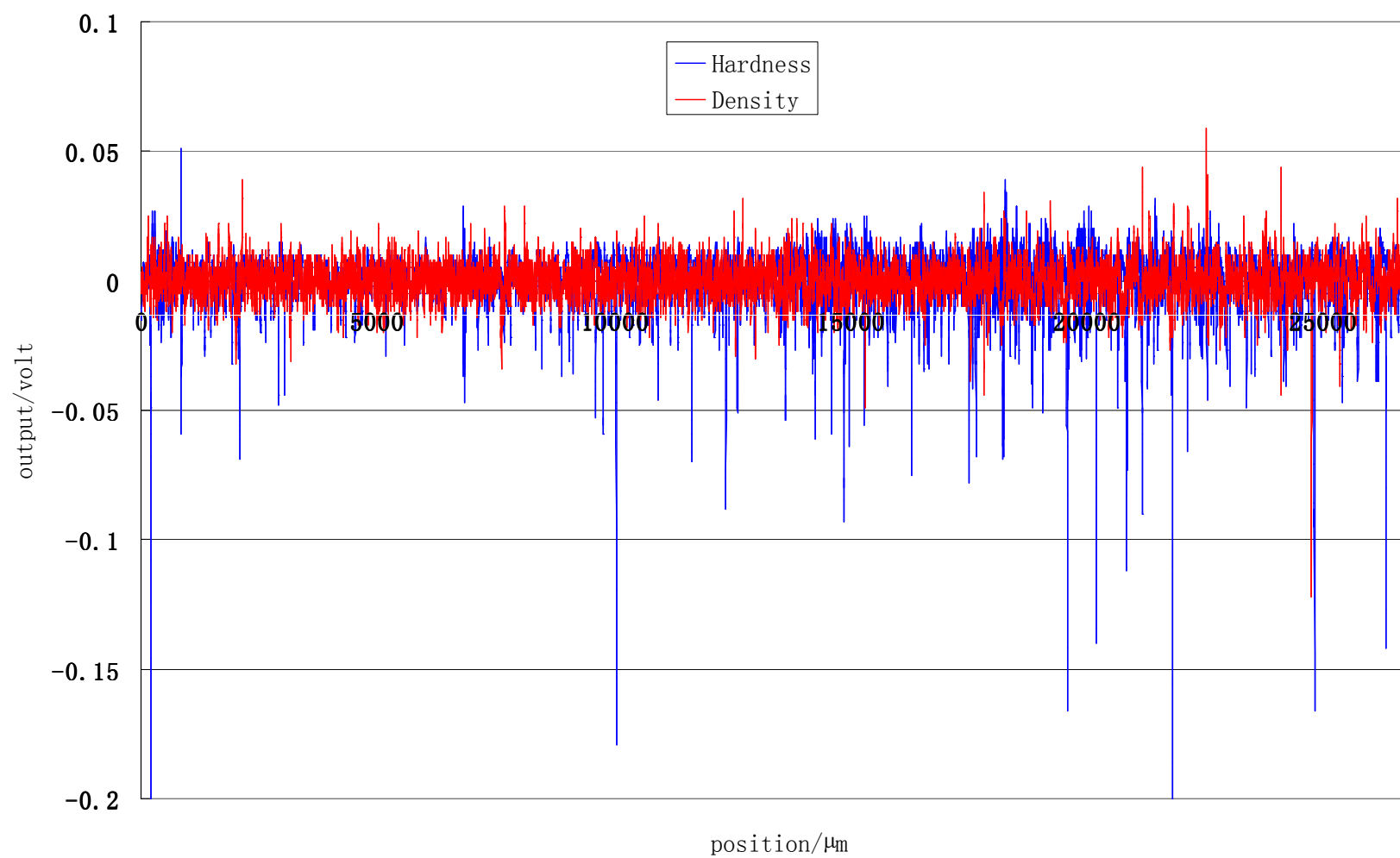
Density-Hardness Measurement

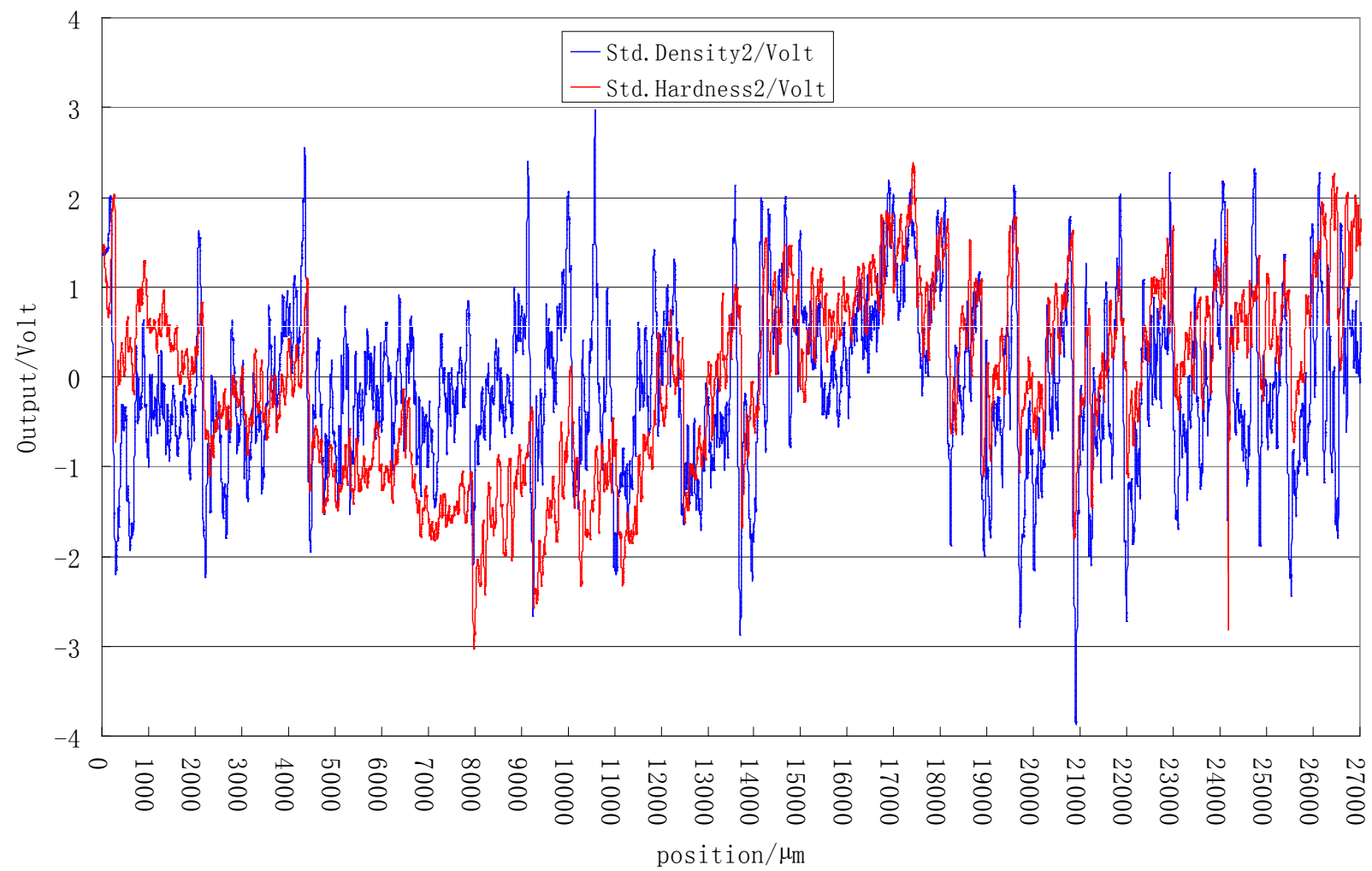
Nothofagus fusca, corr.Density-Hardness, sample 18b,2 run



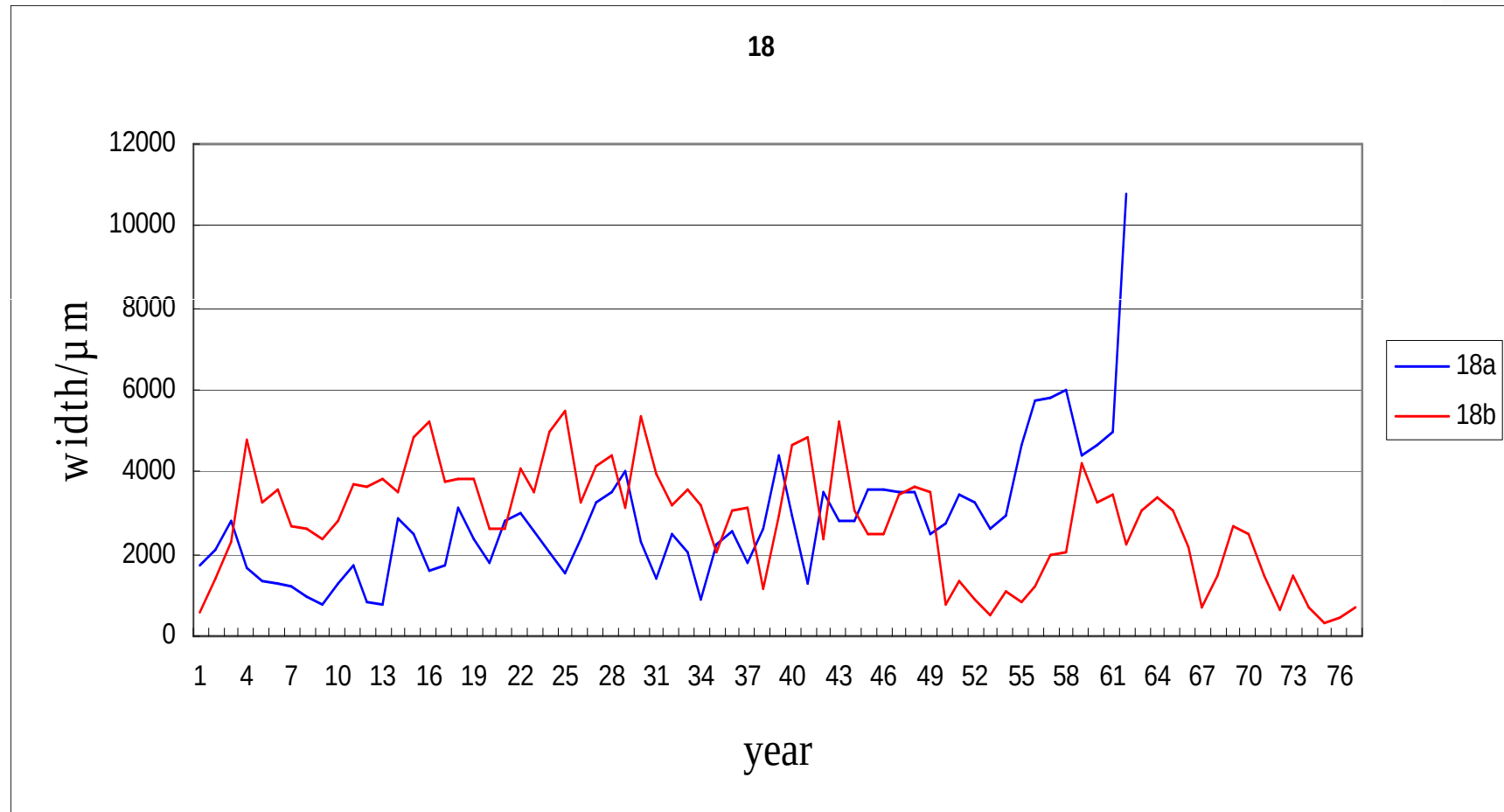
Density-Hardness Measurement



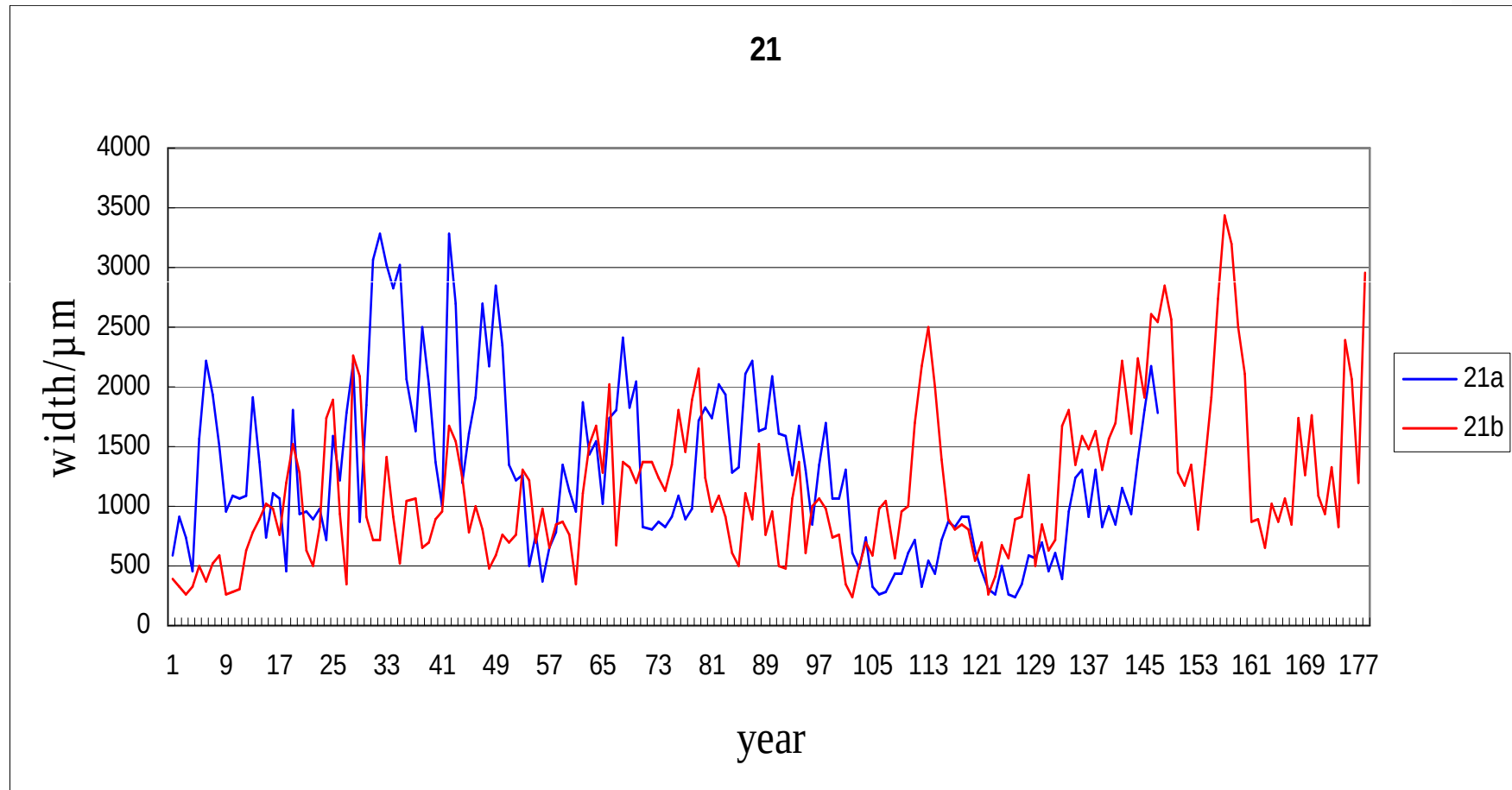




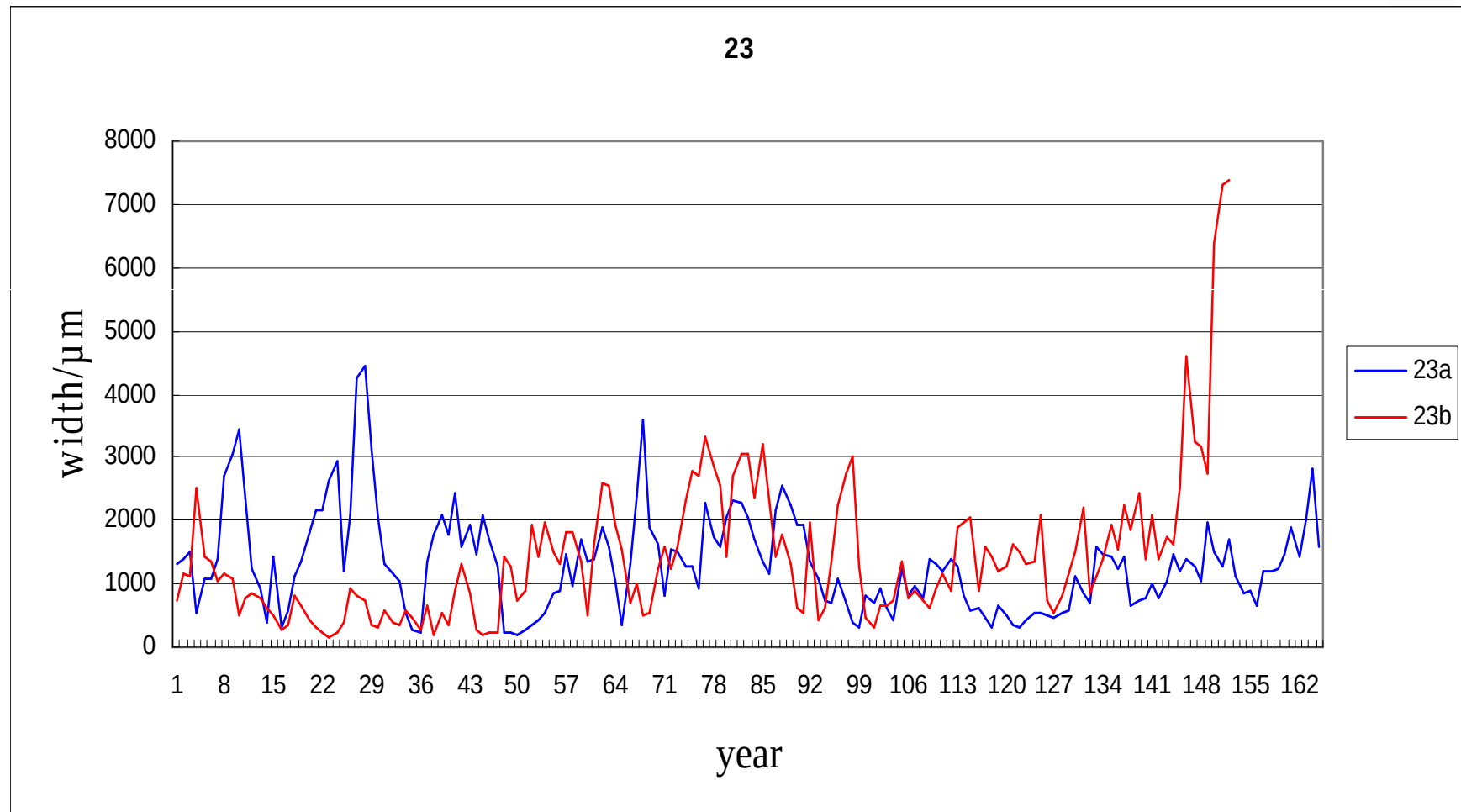
Discussion



Discussion



Discussion



Additional Activities



Valuable timber production
with valuable broadleaved
trees



Getting discs of oak and spruce

Personal Benefits from the Applied Period

- Understanding of how the institute works
- Getting into touch with experts and professionals
- First time get into a tree ring project and get familiar with the technique of HF-densitometry
- Influence on my future career
- Getting familiar with German society and culture



Sincere Thanks to



- Prof. Spiecker for arranging the applied period study
- Dr. Hans-Peter Kahle for his role as supervisor
- Mr. Koch for his help during the whole study period, especially technical help
- Dr. Schinker for his help with the HF-densitometry
- Ms. Stadler for arranging my AP related issues
- Martin Kong as my student tutor helping me
- Victor and Daniela for training me
- All other members from the Institute for Forest Growth

Reference

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