

A developing in-situ inspection method on microstructure characteristics of wood deformation under loading

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Developing Objective:

1. To find an easy microscopic inspecting method for in-situ detection of microstructure deformation of wood;
2. Provide a possibility for relationship establishment between wood microstructure and loading.

Materials and Methods:



Main Structure

Three hardware parts of the system:

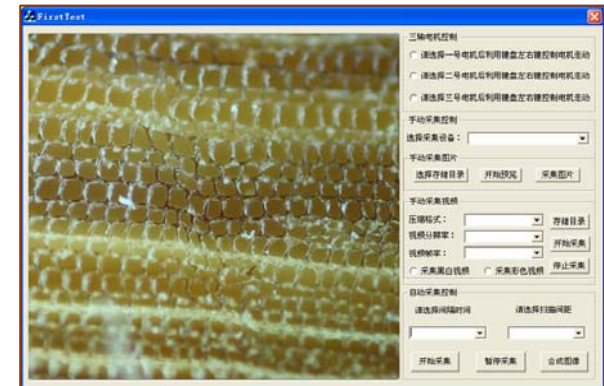
- 1) A micro-mechanical tester;
- 2) A microscopy with auto-focus motor;
- 3) An auto-adjusted platform in three-dimensions.

One software of the system:

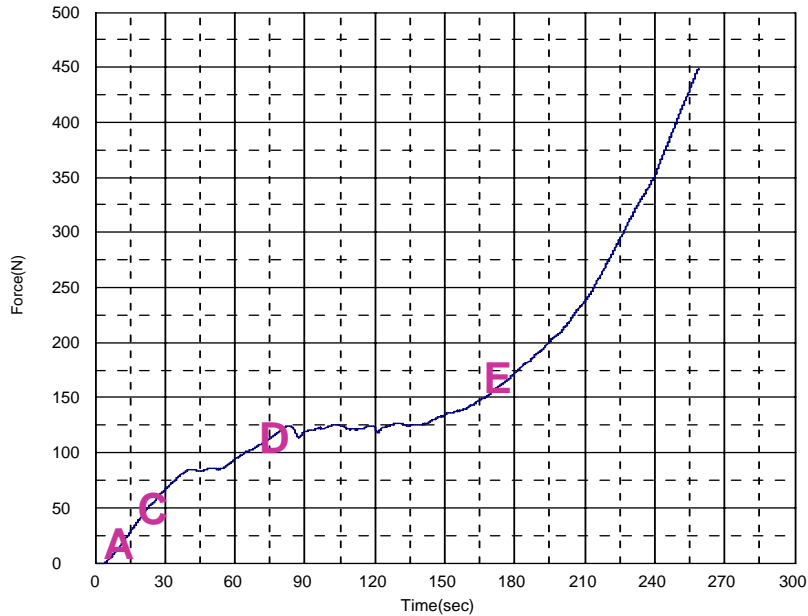
- 1) A self-developing auto-focused photos collection

Function Description

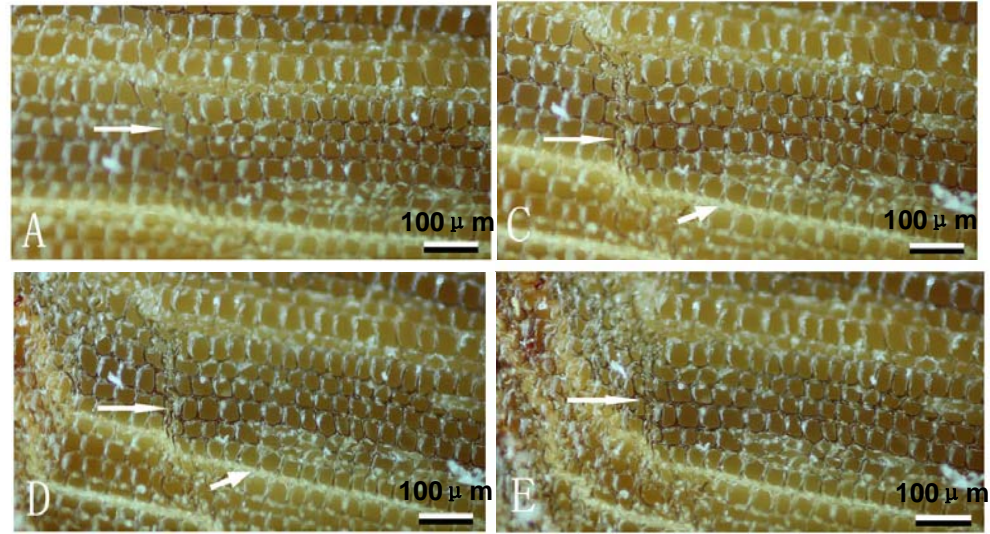
- 1) Photo collection, auto-focus <math>< 1.5s</math>, Max: 48p/s;
- 2) Selected photos to form the confocal picture;
- 3) The loading data/photos, with a same time coordinate



Results:



-Compressive force with time-



-Photo collection-

Conclusions:

Advantages

- 1) Easy operation;
- 2) Within annual ring;
- 3) Real-time records;
- 4) In-situ detection.

Disadvantages

- 1) Requirement of sample surface;
- 2) Not sensitive to big surface deformation;
- 3) Limited inspection area / to normal SP.

