

2010 Departmental Seminar

Thursday 15 April 2010

3.00 pm

Mechanical Engineering Seminar Room – E547

A FRST WOOD SCIENCE RESEARCH PROJECT AT THE UNIVERSITIES OF CANTERBURY, AUCKLAND AND MANCHESTER UK

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Abstract:

A major research grant supports work on wood science. It is a joint project involving the universities of Canterbury, Auckland and Manchester UK. The departments involved at Canterbury are Forestry, Mechanical Engineering and Electrical Engineering. The Auckland contribution is in the School of Biological Sciences.

I will give an account of the work based in Mechanical Engineering at Canterbury and in the Materials Science Centre of the University of Manchester. This is in two parts.

The first involves measurement of the dynamic vibrational energy loss in softwood. The matrix of the cell wall structure comprises a mixture of hemicelluloses, which are polymer chain structures with a high affinity for water. The hope is to reveal energy loss peaks due to glass transitions in the individual hemicelluloses that could be used to measure their concentration.

The second investigation is concerned with the strains that arise when the water content of stressed wood changes. These strains, called mechano-sorptive strains, arise from hydrogen bonds; so if the concentration of a hemicellulose with a high affinity for water changes then this should be reflected in changes in the mechano-sorptive strain.