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Modeling Relaxation Length and Half-Thickness of Wood by Method of Gamma Radiation

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Abstract: Relaxation lengths and half-thickness values of different types of wood were determined using gamma radiation from $^{60}C0$ source. Results show that oxystigma (Oxystima spp) has the highest relaxation length of 23.810cm, while mangrove (Rhizoohora spp) has the least relaxation length of 1.247 cm. Results also show that Oxystima (Oxystima spp) has the highest half thickness value of 16.500 cm and Mangrove (Rhizophora spp) has the least half-thickness value of 0.864 cm. Two mathematical models have been developed for the prediction or determination of density ρ, variation with relaxation length and half thickness value of wood. A good agreement (greater than 80% in most cases) was observed between the measured values and the predicted ones (models 1 and 2).

Key Words: Relaxation Length, Half-Thickness Value, Gamma Radiation