1031-92-140 **Nikolay Strigul*** (nstrigul@stevens.edu), Department of Mathematical Sciences, Stevens Institute of Technology, Hoboken, NJ 07030. *On existence and stability of stationary forest canopies in the perfect plasticity approximation model.*

Recently we have introduced tractable macroscopic equations for forest dynamics, so called the perfect plasticity approximation (Strigul et al., 2007). The model describes forest dynamics at the stand level using only information concerning individual trees; in general, this scaling method is based on the assumption that tree crowns demonstrate infinite plasticity patterns in competition for light. This model can be written as a system of hyperbolic partial differential equations and an additional integral equation. In the initial paper we have derived a series of analytical results concerning stationary state and stability of forest canopy under the simplest (but still realistic) assumptions that understory and overstory trees grow with constant diameter rates and die with constant mortality rates. In this presentation we show new results that several more complicated cases, where growth and mortality rates are not constants are also analytically tractable. Formally speaking we investigated existence and uniqueness of real roots of the integral equation determining stationary states, and then we used the local perturbation method to investigate if these states are asymptotically stable. Finally, the analytical results have been compared with computer simulations. (Received August 07, 2007)