

**QUALITATIVE BEHAVIOUR OF A
PHYTOPLANKTON GROWTH MODEL IN A
PHOTOBIOREACTOR**

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Abstract: A nonlinear light- and nitrate-limited phytoplankton growth model in a photobioreactor is presented. Its qualitative steady input-output behaviour is studied and compared to biological observations of the evolution of ratios between nitrogen, carbon, chlorophyll with respect to the two considered inputs (light and dilution rate). A qualitative validation of the model is provided. The steady input-output behaviour is also used to get linear regressions that provide an estimate of the parameter values. The simulations of the model identified and validated with this approach are consistent with the data.

Keywords: photobioreactor, phytoplankton, qualitative analysis, identification, validation.