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ANALYSIS SEMINAR

The logistic equation with nonlinear advection term

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Abstract. We study an elliptic logistic equation with nonlinear advection term arising from population dynamics. The nonlinear advection term meaning that the velocity of transport movement of the species depends on its density and may be higher or lower. From the mathematical point of view, the inclusion of this term brings technical difficulties in the analysis, especially because it has no definite sign. We apply the method of subsolution and supersolution and Picone Identity to show the existence and uniqueness of a positive solution. We also study the behavior of the solutions with respect to parameters that appear in the equation.