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Summer R. Atkins* (srnatkins@ufl.edu), **Maia Martcheva** (maia@ufl.edu) and **W. W. Hager** (hager@ufl.edu). *Regularization of an Optimal Fishery Harvesting Problem via Bounded Variation.*

We consider an optimal harvesting problem using a spatially explicit model with Dirichlet boundary conditions assumed on the state variable. The optimal control problem is linear with respect to the harvesting control. Previous presentations of this problem demonstrated complications associated with numerically solving for the problem due to the presence of a singular subarc. In those numerical simulations, wild oscillations occurred along the singular region, which resembled a phenomenon called “chattering”.

As a means of generating a more realistic optimal harvesting strategy, we consider regularizing this problem by adding a bounded variation term to the cost functional. We numerically solve for this regularized problem by use of a Polyhedral Active Set Algorithm called PASA that is used for solving general nonlinear optimization problems with sparse polyhedral constraints. In solving for the regularized problem, we generate a harvesting strategy that does not oscillate along the singular region. Additionally, the numerical results obtained indicate the need for marine reserves. (Received September 15, 2020)