

1048-74-73

Silas Alben* (alben@math.gatech.edu), 686 Cherry St. NW, Atlanta, GA 30332. *The structure of fish fins.*

Fish fins have evolved over millions of years in a convergent fashion, leading to a highly-intricate fin-ray structure that is found in half of all fish species. This fin ray structure gives the fin flexibility plus one degree of freedom for shape control. I will present a linear elasticity model of the fin ray, based on experiments performed in the Lauder Lab in Harvard's Biology department. I will then describe numerical simulations of a fully-coupled fin-fluid model, based on a new method for computing the dynamics of a flexible bodies and vortex sheets in 2D flows. The simulations are applied to the mode of fish swimming based on tail fin oscillations. (Received January 23, 2009)