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Aaron B Luttman* (aluttman@clarkson.edu), Clarkson University, Box 5815, Potsdam, NY
13676. *A Variational Optical Flow Approach to Computing Oceanic Flows*. Preliminary report.

Optical flow is a technique from computer vision for computing vector fields that describe physical movement in a scene based on image data. The classical variational methods were designed to compute flows that are smooth and divergence free, which can be appropriate for rigid motions, but more recently methods have been developed based on total-variation regularization and the continuity equation from fluid dynamics that allow the computation of non-smooth and divergent flows. In particular, minimizing hybrid energies allows the computation of turbulent flows describing dynamical processes. We present some recent approaches to computing flows from satellite imagery, with applications to modeling flow dynamics in oceanic waterways. (Received August 07, 2010)