Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Exploitation of combined visible hyperspectral and infrared imagery GEOFFREY B. SMITH, GEORGE O. MARMORINO, Naval Research Laboratory, W. DAVID MILLER, Computational Physics Incorporated — Natural and anthropogenic surfactants accumulate at the air-sea interface, forming microlayer films, slicks, and foam patches. The resulting enhanced viscoelasticity of the interface alters the small-scale wave spectrum and near-surface turbulence. These changes alter the surface thermal boundary layer and "skin" temperature, making infrared thermal imagery ideal for detecting/mapping/studying ocean slicks. Slicks are found under a range of conditions and can result from physical straining of the sea surface (e.g. internal waves) as well as from local biological processes (e.g. plankton blooms). Airborne datasets that combine simultaneous airborne infrared and visible wavelength hyperspectral remote sensing data are now available and provide new opportunities to investigate the physical and biological processes that result in ocean slicks. In addition to the multiple sensors, these datasets are at spatial and time scales much smaller than possible with available satellite remote sensors. This enables the study of a much broader range of phenomena. In particular we investigate the relationship between surface accumulations of vegetative material, ocean slicks and surface temperature changes. We also investigate the relationship between the presence of slicks and water column chromophoric dissolved organic matter (CDOM).

Geoffrey Smith
Naval Research Laboratory

Date submitted: 05 Aug 2008 Electronic form version 1.4