**Sea-Spray Mediated Enthalpy Flux**

Daniel Granovsky and Chris Zappa

Current enthalpy flux models cannot explain the observed strength of hurricanes; modeling suggests that the hurricanes should be much weaker. It has been suggested that the flow of enthalpy from the ocean surface to the atmosphere is increased by sea spray droplets, which effectively increase the surface area of the ocean. While droplets that evaporate entirely would produce no net enthalpy flux because the boundary layer would have to provide all the latent heat to evaporate the droplet, It has been demonstrated by Andreas and Emanuel that re-entrant droplets that evaporate partially before returning to the sea, would contribute to the net enthalpy flux. The purpose of this research project is to determine whether it is possible to observe and quantify this phenomenon via infrared video imagery. Several image-processing techniques were written in the Matlab language for the purpose of simplifying these observations. A thresholding program was written for identifying particles in images. A particle tracking algorithm was developed from scratch in order to calculate displacement and velocity vectors. A program was written to bin particle diameters by height. Results show that particle size tends to decrease with distance from the ocean surface, which supports the research of Andreas and Emanual; larger, heavier particles tend to re-enter the water, while the smaller particles at the top have a greater tendency to evaporate.