Abstract Submitted
for the PSF14 Meeting of
The American Physical Society

Analysis of gravity wave perturbations observed in the centroid profiles of polar mesospheric clouds during tomographic reconstruction of AIM satellite imagery VERN HART, William Woods University, MICHAEL TAYLOR, Utah State University, TIMOTHY DOYLE, Utah Valley University, YUCHENG ZHAO, Utah State University, AIM COLLABORATION — NASA's Aeronomy of Ice in the Mesosphere (AIM) satellite is the first with a sole commission of studying polar mesospheric clouds (PMCs). These clouds, which are being observed with increasing frequency, are of interest due to their sensitivity to climate changes. Three-dimensional (3D) tomographic reconstructions of PMCs will be presented which were rendered from a series of AIM satellite images. An intensity-weighted centroid was calculated to form surface plots showing altitude variability of the mean albedo. Evident in these plots were coherent wave fronts propagating through the layer, suggesting the presence of gravity wave perturbations in the data. FFT analysis was performed and results showed a strong contribution from ∼60-90km wavelengths. It was also found that high centroid altitudes generally corresponded well with low-intensity regions in the albedo images. This correlation indicates that the presented method could be applied to particle size investigations as denser particles are found at lower altitudes and scatter light more strongly than lighter particles. Results from five different AIM orbits will be presented and discussed as they apply to investigating wave-induced dynamics when resolution is limited.

Vern Hart
William Woods University

Date submitted: 17 Oct 2014 Electronic form version 1.4