



## **A Pluto Central-Flash Occultation: Constraints on Haze Abundances, Temperature Profiles and Zonal Winds**

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Central flashes occur in occultation light curves when the observing station is located close to the center of the shadow path. We observed a double-peaked central flash event on 31-JUL-2007 from the Mt John Observatory in New Zealand, in two filters simultaneously. A stellar occultation by Pluto in 2002 was observed from various telescopes on Mauna Kea over wavelengths spanning B- through K-bands and showed compelling evidence of a wavelength-dependent opacity source. Unlike the 2002 results, the 2007 central flash light curve shows no difference between the 0.5 and 0.7 micron light curves, suggesting that the haze observed in 2002 is a variable phenomenon. In the absence of haze, the height of the central flash peaks must be due to differential refraction; the peaks therefore provide strong constraints on the location and magnitude of a thermal inversion in Pluto's atmosphere at the time of the event. Finally, the relative height and spacing of the two central flash peaks are extremely sensitive constraints on Pluto's oblateness, which in turn can constrain the magnitude of zonal winds.