

SPECTROPOLARIMETRY OF THE DEEP IMPACT TARGET COMET 9P/TEMPEL 1 WITH HiVIS

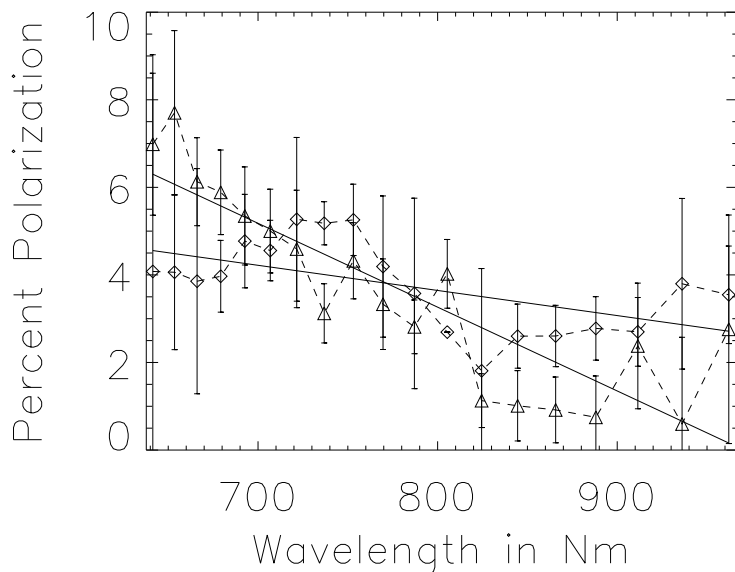
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High resolution spectropolarimetry of the Deep Impact target 9P/Tempel 1 was performed from June 30 to July 6 2005 with the HiVIS Spectropolarimeter with the AEOS 3.67m telescope on Haleakala, Maui. We observed atypical polarization spectra that changed significantly in the few hours after the impact. The polarization of scattered light as a function of wavelength is very sensitive to the size and composition (complex refractive index) of the scattering particles, constraining the properties and evolution of the impact ejecta and dust comae. The polarization at 6:30 UT was 4% at 650 nm falling to 3% at 950 nm, whereas it was 7% falling to 2% an hour later (-0.9% per 1000Å to -2.3% per 1000Å). This is an atypical *blue* slope, which became more *blue* 1 hour after impact.



Degree of polarization for comet 9P/Tempel just after impact shown with $3\text{-}\sigma$ error bars. The data was taken starting 8 minutes after impact, from 6-7 UT (top curve at 900nm, shown with diamonds) and 7-8 UT (bottom curve at 900nm, shown with triangles). A linear fit is plotted to guide the eye. A single point at 805nm (order 11) in the 6-7 UT data set has been discarded and replaced by the average of neighbor points, and has no error bars. The polarization spectra from 6-7 UT curve had a shallow negative slope of $-0.9\pm 0.2\% / 10^3 \text{ \AA}$. The 7-8UT curve had a slope of $-2.3\pm 0.3\% / 10^3 \text{ \AA}$.