

## Polarization of the Diffuse Galactic Light at North Celestial Pole

C. Lee<sup>1</sup>, S. M. Kwon<sup>2</sup>, J. L. Weinberg<sup>3</sup>, S. S. Hong<sup>1</sup>

<sup>1</sup>*Astronomy Program, SEES, Seoul National University, Seoul, KOREA*

<sup>2</sup>*Department of Science Education, Kangwon National University, Choonchun, KOREA*

<sup>3</sup>*Space Astronomy Laboratory, 3440 Quinn Ridge Drive, Snellville, GA, USA*

On a number of nights the north celestial pole (NCP) was observed atop Mt. Haleakala, Hawaii and the direction and degree of night sky polarization were monitored all through the nights with time resolution of 2 minutes. If zodiacal light is sole source of the night sky polarization, the observed degree of polarization should stay constant and the direction would always point perpendicular to the scattering plane, which rotates at 15 degrees per hour due to the Earth's diurnal motion. However, deduced position angle of the polarization direction did not exactly follow the diurnal rate and difference from the expected direction draw a sinusoidal curve with time. The observed degree of polarization also varied with time in a systematic way. It is shown that an introduction of atmospheric scattered light and diffuse galactic light as additional polarization sources explains the departure from the diurnal rate rigorously and the observed time-dependence of polarization degree satisfactorily. This enables us, for the first time, to measure the polarized brightnesses of the diffuse galactic light at the pole and also of the atmospheric scattered light at zenith distance of about 70 degrees.