Photopolarimetric observations of comet Halley

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Optical linear polarization data are reported along with the photometric data for coma and tail region of comet P/Halley observed on 1986 March 19. Polarization measurements were made on 1 m telescope of IIA, using PRL polarimeter with IHW filter system. Polarization in the continuum has been found to increase with wavelength ($13.870 \pm 1.355\%$ at 3650 Å to $18.237 \pm 0.465\%$ at 6840 Å). The polarization vector is found to be perpendicular to the scattering plane and remains almost constant for coma (about 165° measured east from north) whereas position angle slightly increases with wavelength for the tail region (by 7° from 3650 Å to 6840 Å). This can be explained by invoking at least two different kinds of grains in the tail. The wavelength dependence of polarization shows a decrease across the different emission bands (CN, C_3, CO^+, C_2, and H_2O^+), which cannot be accounted for if emission flux is totally unpolarized. Using Stokes parameters polarization values for different emission bands have been calculated. CN, C_3, and C_2 show polarization between 5 to 7%, whereas the ionic molecules CO^+ and H_2O^+ show polarization of about 21 and 33% respectively.

An investigation into the association between Eta Aquarid meteor shower and Halley's comet

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The Eta Aquarid meteor shower was observed for three consecutive nights on May 2–3, May 3–4 and May 4–5 for four years 1983–1986. A minimum number of three observers simultaneously kept a watch on the whole sky. No increase was found in the frequency of fall of meteors in 1986, the year of Halley's comet. This showed that this meteor shower has not been formed from the debris left out by Halley's comet.

But the time of maximum fall of meteors advanced by two hours in 1986. This suggests that it is possible that the orbit of this meteor shower might have undergone some perturbation due to the passage of Halley's comet by its side.

Perihelion distribution of long period 'new' comets

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Marsden's 1982 catalogue lists 582 comets including 89 that are new i.e. they are believed to have visited the solar system just first time. These comets are the least affected by planetary perturbation and thus can provide a clue to galactic influence and connection with solar apex. By diagonalizing the matrix of sample moments