P26a Light Polarizations in a Scattering-Dominated Region

松村雅文[12]、Pierre Bastien[1] ([1]Departement de Physique, Universite de Montreal, [2] 香川大教育)

Large values of linear polarization are observed in many young stellar objects, and are interpreted as due to light scattering by dust grains around the star. Various evidences show that multiple scattering is present around many young stars. However, the effect of grain alignment has not been considered so far, even though it may have a great effect on the polarization.

In this paper, we study the linear and circular polarization from singly scattered light with the assumption of a spherical and homogeneous distribution of grains around a star. We use the results of exact scattering calculations on the basis of the Fredholm integral equation method (Matsumura & Seki 1991, 1996), which is applicable for homogeneous ellipsoidal particles.

If nonspherical grains are aligned, the influence will appear in the linear and circular polarizations. Our 'polarization map' for linear polarization in scattered light shows the presence of 'aligned vectors' near the central star. The direction of these aligned vectors is perpendicular to the direction of the alignment, and is *not* the same as that of the linear polarization in the transmitted light. When the scattered light and the transmitted light are not resolved and are observed at the same time, the quantities such as the degrees of linear and circular polarization, and the position angle of linear polarization, will depend on wavelength, because the contributions of the scattered light and the transmitted one vary at different wavelengths. Our model shows a 'polarization reversal' at near infrared wavelengths, i.e. a change of position angle by 90 degrees.