[구IM-03] Model Simulations for the Dust-Scattered Far-Ultraviolet in the Orion-Eridanus Superbubble

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We present the results of dust scattering simulations carried out for the Orion Eridanus Superbubble region by comparing them with observations made in the far-ultraviolet. The albedo and the phase function asymmetry factor (g-factor) of interstellar grains were estimated as well as the distance and thickness of the dust layers. The results are: 0.39-0.45 for the albedo and 0.25-0.65 for the g-factor, in good agreement with previous determinations and theoretical predictions. The distance of the assumed single dust layer, modeled for the Orion Molecular Cloud Complex, was estimated to be ~110 pc and the thickness ranged from ~130 at the core to ~50 pc at the boundary for the region of the present interest, implying that the dust cloud is located in front of the Superbubble. The simulation result also indicates that a thin (~10 pc) dust shell surrounds the inner X-ray cavities of hot gas at a distance of ~70 - 90 pc.

[구IM-04] Dust-scattered FUV halo around Spica

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The far ultraviolet (FUV) wavelength (900~1750Å) range includes a wealth of important astrophysical information related to the cooling of hot gas, fluorescent emission from H2 molecules, and starlight scattered off dust particles. Among these, we would like to focus on the scattered emission of the central star by dust with the example of the FUV halo surrounding α Vir (Spica). While scattering properties of dust have been studied with the GALEX data, the improved dataset of STSAT-1 revealed many detailed structures of this interesting region. For example, the FUV continuum map obtained from the STSAT-1 observations shows enhanced emission in the southern part of the Spica halo region, where the dust level is also high. In fact, the FUV continuum intensity is seen to have a good correlation with the IRAS 100μm emission data. It is also seen that the scattered spectrum is softer than the original one emitted by the central star, which is attributed to the increase in the dust-scattering albedo with wavelength. We have developed a Monte Carlo code that simulates dust scattering of light including multiple encounters. The code is applied to the present Spica halo region to obtain the scattering properties such as the albedo and the phase function asymmetry factor.