[구IM-03] The Difference of the Absorption Properties of the C IV and Si IV Between two Superbubble : Loop I and Orion Eridanus

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The measurement of far-ultraviolet (FUV) absorption features are presented. Highly ionized species of C IV and Si IV provide the significant information about the two well known superbubbles, Loop I (L1) and Orion Eridanus (OES). The diagnostic differences were discovered by their line width. It is possible that the line broadening toward L1 is related to the turbulent motion of shock. The actual differences are attributed to the evolution of supernova remnant. Supernova induced flow are still active through L1 while the supernova shock of OES shows tiny motion. The observed line ratio of N(CIV)/N(Si IV) for L1 and OES are well coincident with the turbulent mixing (Slavin et al. 1993) and the thermal conduction model (Borkowski et al. 1990), respectively.

[포IM-04] Can the Lyc leaked out of H II regions explain the DIG ?

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It has been claimed that the diffuse Hα emission of face-on galaxies may be produced by ionizing photons escaping from the density-bounded H II regions into the diffuse interstellar medium (ISM). We present an attempt to explain the diffuse Hα emission of a face-on galaxy M51 with an assumption that the Lyc escaping from H II regions can be transmitted freely without significant absorption. It is found, however, that the Hα surface brightness of the diffuse ionized gas (DIG) seen in face-on galaxies is not reconcilable with this scenario. The models with negligible absorption, of which the overall morphology of the Hα surface brightness seems to resemble the observed image, are not capable of reproducing sufficient Hα flux because of too low absorption to result in enough recombination. On the other hand, the models with strong absorption, but still very weak compared to that expected in homogeneous medium, show highly concentrated Hα emissions around H II regions, and cannot explain the diffuse Hα emission in interarm regions. We conclude that alternative ionizing sources located outside of the classical H II regions, such as late OB stars in field, are indispensable to explain the ionization of the DIG.