DIFFUSE γ-RAY LINE EMISSION FROM MULTIPLE OB ASSOCIATIONS IN CYGNUS

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The COMPTEL observations of the diffuse galactic 1.809 MeV emission attributed to the radioactive decay of ^{26}Al have confirmed the diffuse nature of this interstellar emission line. One of the most significant features of the reconstructed intensity patterns is a flux enhancement in the direction of the Cygnus region. This region is fairly young and contains a wealth of massive stars, most of them grouped in Cygnus OB associations. Extensive model fits confirm the hypothesis of massive stars and their descendent supernovae being the dominant sources of interstellar ^{26}Al. Massive stars and supernovae are known to impart a large a mount of kinetic energy into the surrounding causing shockwaves and large cavaties to expand into the ISM. In addition, for massive stars a large fraction of the radiation lies in the extreme ultra-violet causing photoionisation of the surrounding ISM.
We therefore applied a population synthesis model in combination with a analytic model for the expansion of superbubbles to the Cygnus OB associations. This model is extented with a simple photoionisation approximation to compute intensities of thermal free-free emission originating from the photoionised ISM. Beside the expected 1.809 MeV flux the model allows the prediction of γ-ray line intensity due to interstellar ^{60}Fe,the sizes and expansion parameters of expected HI-structures and the free-free intensities. We discuss our present understanding of the Cygnus region and it's massive star phenomena.