
10.07.07 Extreme Ultraviolet/Soft X-Ray Background: The Temperature Distribution of the Emitting Gas. R. Stern, JPL, California Institute of Technology; and F. Parece, UC Berkeley - An examination of data from the Apollo-Soyuz diffuse background survey and earlier observations obtained with rocket-borne proportional counters has provided new constraints on the cosmic EUV spectrum in the 20-280 eV range. This spectrum is analyzed by means of a hot interstellar plasma emission model wherein the plasma is either isothermal or characterized by a differential emission measure with a power-law temperature distribution. In the isothermal case, physically realistic fits are obtained only for a narrow range of model parameters near T=10^5 K, neutral hydrogen column density N_H < 10^{32} cm^{-2} and emission measure, EM = 10^{47} cm^{-5} pc. Compatibility with derived parameters for OVI absorbing gas in the interstellar medium is achieved only if the gas is not in pressure equilibrium with its surroundings or, assuming pressure equilibrium, if the average OVI density within = 400 pc of the Sun is a factor of 4 above the average <n_{OVI}> measured by Jenkins (1978a) over typical distances of several kpc. In the temperature distribution models, reasonable fits to the data are obtained only if the observable emitting gas has a high temperature cut-off at ~10^8 to 10^9 K. Consistency between the physical characteristics of the plasma derived by the EUV emission and OVI absorption technique can be obtained for a local value of n_{H2} ~ 5 x 10^4 cm^{-3} and p/k ~ 10^8 cm^{-3} K provided the power law Index of the temperature distribution ~ 1.0. The filling factor of the EUV emitting gas in the 10^8-10^9 K range implied by these measurements is ~ 0.12. We discuss the consistency of the derived parameters with those expected from the interstellar medium model of McKee and Ostriker (1977).

10.08.07 Evidence for Shocked Interstellar Gas Toward the Perseus OB1 Association, S. R. Federman, Univ. of Texas - Optical measurements of absorption lines of CH and CH toward ζ, η, and θ Per reveal a shift in velocity between the two molecular species. The equivalent width of the CH line varies directly with the amount of shift seen. The present observations confirm predictions of the chemical model formulated by Elitzur and Watson. The model requires shocks for producing sufficient amounts of CH; therefore, strong evidence for shocked interstellar gas is now available. A reexamination of the optical results for OH toward ζ and η Per indicates that a substantial fraction of the OH also was formed in the high temperature, shocked gas.

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10.09.07 Galactic Spiral Structure in a Cloudy, Supernova-Dominated Interstellar Medium. F. H. Levinson and W. W. Roberts, Jr., U. of Virginia - We pose the primary question which motivated this work: Can large-scale galactic shock waves, which are thought to underline the regular, well-delineated spiral structure in some galaxies, form and persist in a cloudy, supernova-dominated interstellar medium?