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PREGRAPHITIC MOLECULES AND THE RED-RECTANGLE EMISSION

L. d'Hendecourt and A. Léger
G.P.S. Tour 23, University Paris VII - 2 place Jussieu -
75251 PARIS CEDEX 05 - FRANCE

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The Red-Rectangle (AFGL 918) nebula emission has several components:

- (1) Emissions and absorptions characteristic of a H^+ region.
- (2) Blue dominated light scattered from the illuminating star.
- (3) A large and broad emission bump in the red part of the spectrum that gives the red aspect of the nebula.
- (4) Narrower emission bands superimposed on feature (3).
- (5) IR emission bands at 3.3 - 6.2 - 7.7 - 8.6 and 11.3 μm .

In light of the recent identification of component (5) as emission from pre-graphitic molecules (Léger and Puget 1984), we investigate the possibility that component (3) is luminescence from the same molecules.

The broadness of this bump prevents a definite spectroscopical identification with any species. However, its wavelengths are typical of *phosphorescence from large pregraphitic molecules*.

An important argument is the estimate of the needed *abundance* and *luminescence yield* of the carrier. Considering the luminosity of the illuminating star, that of the nebula, its optical depth... it is found that, with a luminescence yield of 25% in energy, the *species responsible has to be responsible for ~ 10% of the absorption in the UV* by the nebula material. The pregraphitic molecules can fulfill those requirements, for instance, the phosphorescence quantum yield of hexabenzocoronene is ~ 40% (Schmidt, 1985). For the abundance, they are among the very few species which are at that level : 10% of the dust mass and 30% of the 2200 Å absorption, as estimated in the IRAS Cirrus.