THE PARTITION FUNCTION, Z_H, SPECIFIC TO THE DIATOMIC MOLECULAR GAS INTERACTION WITH THE LASER RADIATION - THE STUDY OF THE MULTIPHOTONIC EXCITES FOR THE MOLECULAR DISSOCIATIONS

S. POPESCU, *Research Institute for Electrical Engineering, ICPE - Bistrita, RO-4400 Romania.*

A method is presented for dissociation of diatomic molecules, found in a precisely defined atmosphere, through successive absorption of a quantum energy generated by laser effect, at a certain frequency and a certain density of energy, until the energy in this way accumulated became equal with the dissociation energy.
Thus, for a given molecule existing in an atmosphere at a temperature T_c characteristic of its dissociation condition through the proposed method, one can establish the frequency and energy density values of laser radiation that can dissociate the molecule. Concerning the fact that for a known gas formed by certain diatomic molecules the physical size T_c and ν_{co} must have well determined values[a] and knowing the volume V on the premises in which the dissociation of these molecules takes place, one can determine the value of the critical pressure, P_c, thought a state thermic equation as follows:

$$P_c = \frac{1}{V} f[T_c(\nu_{co})] = \frac{8\pi h}{3c^3} \int_{\nu_c-\Delta\nu_c}^{\nu_c+\Delta\nu_c} \frac{\nu d\nu}{\exp.(\frac{h\nu}{kT_c})-1} + NkT_c(\frac{\delta \ln Z_M}{\delta V})_{T_c,N}$$

A few possible expressions of the partition function, Z_M will be presented in the extended work.

[a] S. Popescu, ICP Information Newsletter, 207 (1997).