Synopsis of Chapters

In the pages for general introduction of this work , I have tried to give a coherent account of twenty six known methods which can be used for approximate or exact solutions of transfer problems. In chapter I of this work , exact solution of equation of transfer in semi-infinite ,plane parallel Stellar atmosphere in Milne-Eddington model concerning radiative equilibrium has been discussed . The Planck's function has been considered as a source function assuming it to be linear in optical depth . Few pages of Chapter II deal with the general introduction of that chapter. Part I of chapter II concerns with an exact solution of the equation of transfer in axially symmetric plane parallel scattering atmosphere which scatters light in accordance with Rayleigh phase matrix with no incident radiation (taking into considеration the constancy of net flux and account of polarization). The vector transport equation for Stokes parameters in l and r direction has been decomposed into two interlocked scalar integro-differential equations . Part II of Chapter II treats an exact solution of the vector equation of transfer for Stokes'parameters appropriate to the problem of diffused reflection of a parallel beam of radiation incident on semi-infinite plane-parallel atmosphere which scatters light in accordance with Rayleigh phase matrix . Using Chandrasekhar's(1950)derivation the vector transport equation will give rise to four scalar integro-differential equation and a (2X2) vectorintegro-differential equation . This vector integro-differential equation has given two scalar interlocked integro-differentialequations .In chapter III ,exact solution of the equation of transfer appropriate to the problem of diffused reflection of a parallel beam of radiation incident on semi-infinite plane-parallel planetary atmosphere which scatters light in accordance with three terms phase functions has been discussed . Followin Mullikin(1964)the original integro-differential equation will generate three integro-differential equations.

In all the chapters the original or the generated scalar integro differential equations have been transformed into integral equations for emergent intensity I (0,u) at the bounding face. Each of these integral equations has been decomposed into two parts (as usually done in Wiener- Hopf technique), one part gives the emergent intensity in terms of some unknown constants and known H - function (which satisfy a non-linear integral equation), and the other part in general gives the unknown constants in terms of the H-function . The intensity I(t,u) at any level t is obtained by inverting the Laplace transform of the intensity I(t,u) determined in terms of the emergent intensity which has been obtained as the solution of the integral equation . In deriving the intensity at any level for positive scattering angle u the properties of H-function (cf. Dasgupta .1974) around a cut on the negative real axis of the complex plane are taken into account while the intensity at any level for negative scattering angle u has been obtained in Cauchy principal value sense using the Plemelj's formulae (cf. Muskhelishvilli. 1946).

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