

GG3. Generalized Picket-Fence Model for Radiative Transfer. C. E. SIEWERT* (introduced by P. F. Zweifel) AND P. F. ZWEIFEL,† *Middle East Technical University, Ankara*.—The nongray radiative-transfer problem is solved in the generalized picket-fence model, assuming that the (nonscattering) stellar atmosphere is in local thermodynamic equilibrium. In this model, the absorption coefficient is represented as a set of N discrete values over the frequency spectrum. Case's method of singular eigenfunctions¹ is generalized to a system of coupled equations, which in this case have the advantageous feature of a degenerate (vanishing determinant) transfer matrix. The complete spectrum of eigenvalues and corresponding eigenvectors is developed. These eigenvectors are shown to obey general half- and full-range completeness theorems and/or full- and half-range orthogonality theorems. Of special interest is the fact that the continuum spectrum consists of N regions, in each of which the eigensolutions are degenerate. The order of degeneracy is N in the 1st region, $N-1$ in the 2nd, down to 1 in the last. The Milne problem is solved and explicit results given for the extrapolated endpoint and law of darkening. Implicitly, the complete solution for the angular density is given.

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¹ K. M. Case, *Ann. Phys. (N.Y.)* **9**, 1 (1960).