

## Multivalued Behavior for a Two-Level System Using Homotopy Analysis Method

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**Abstract :** We use the Homotopy Analysis Method (HAM) to solve the system of equations modeling the two-level system and extract results which will pinpoint to turbulent behavior. We look at multi-valued solutions as indicative of turbulence or turbulent-like behavior. We take different specific cases which result in multi-valued velocities. The solutions are in series form and application of HAM ensures convergence in some region.

**Keywords :** multivalued solutions, homotopy analysis method, two-level system, equation

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