Reverse Dynamo Mechanism in White Dwarf's 2-Temperture Relativistic Electron-Ion Outer Layer

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We investigated the acceleration/generation/amplification of the large-scale flow/magnetic field due to Unified Reverse Dynamo/Dynamo in White Dwarf's 2-Temperature relativistic electron-ion outer layer, when a hot e-i fraction is added to the bulk degenerate e-i fluid. We have shown the formation/acceleration of fast macro-scale degenerate flows as well as of hot fraction flows from initial turbulent (micro-scale) magnetic/velocity fields. It is found that like in the classical case, the formation of macro-scale flows is an essential consequence of the magneto-fluid coupling; We have also found, that along with degeneracy level and temperature of hot contamination, dispersion of complex mixture of 2-temperature relativistic outer layer of WD plays an extremely important role in acceleration/generation of large-scale magnetic field and flow. For different boundary conditions the different dynamical scenarios are explored. For small k, real roots of dispersion relation are defining the process of either straight Dynamo or Reverse Dynamo. For big k the generation of strong macro-scale fast, locally Super-Alfvénic, flow is guaranteed. However, independent from dispersion, the generated macro-scale hot flow is always stronger than the degenerate flow.

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